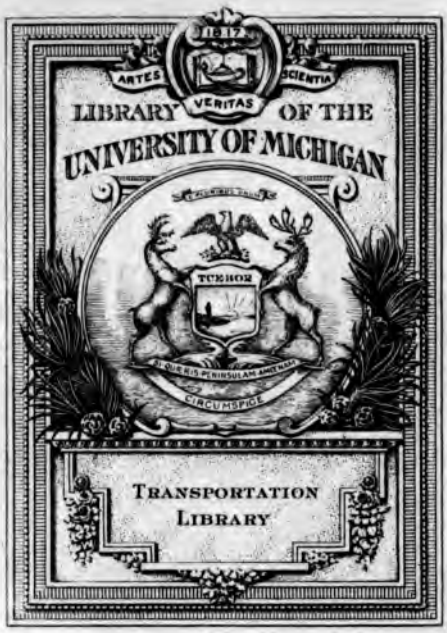
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State of New York.

ANNUAL REPORT

OF THE

CANAL COMMISSIONERS

OF THE

STATE OF NEW YORK.

TRANSMITTED TO THE LEGISLATURE JANUARY 4, 1866.

ALBANY:
C. WENDELL, LEGISLATIVE PRINTER.
1866.

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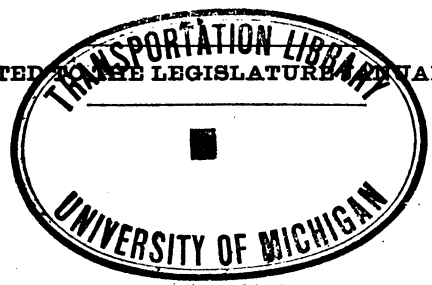

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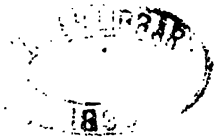

State of New York.

No. 9.

IN ASSEMBLY,

January 4, 1866.

ANNUAL REPORT
OF THE CANAL COMMISSIONERS.

STATE OF NEW YORK:

CANAL COMMISSIONERS' OFFICE,
ALBANY, *January 3d*, 1866.

To the Honorable

the Legislature of the State of New York:

The undersigned herewith transmit their respective reports as Canal Commissioners, for the year ending 30th September, 1865.

Very respectfully,

W. I. SKINNER,
B. F. BRUCE,
F. A. ALBERGER,
Canal Commissioners.

REPORT.

STATE OF NEW YORK:
CANAL COMMISSIONERS' OFFICE,
ALBANY, *November 1st*, 1865.

To the Honorable the Legislature of the State of New York:

Pursuant to the provisions contained in the Revised Statutes, the Canal Commissioners submit their

ANNUAL REPORT.

The Board of Canal Commissioners, at the beginning of the present year, consisted of F. A. Alberger, president, whose term of office expired on the 31st day of December, 1864; B. F. Bruce, secretary, whose term of office expires on the 31st day of December, 1866, and William I. Skinner, whose term of office expires on the 31st day of December, 1865.

On the first day of January last the Board consisted of Wm. I. Skinner, B. F. Bruce and F. A. Alberger. The Board was reorganized by the election of Wm. I. Skinner, president, and F. A. Alberger, secretary.

To Wm. I. Skinner was assigned, in special charge, the Eastern division of the canals, which is made up as follows:

	Miles.
Erie canal, from Albany to east bank of the Oneida Lake canal,	136
Champlain canal	66
Glens Falls feeder	12
Pond above Troy dam	3
Black River canal, Black River improvement	98

To B. F. Bruce was assigned, in special charge, the Middle division of the canals, which embraces the following:

	Miles.
Erie canal, from the east bank of the Oneida Lake canal to the county line between Seneca and Wayne counties, including the several feeders and reservoirs	78

	Miles.
Chenango canal, feeders and reservoirs	97
Oswego canal	38
Oneida Lake canal	7
Oneida River improvement	20
Seneca River towing path	5¾
Cayuga and Seneca canal	23
Cayuga inlet	2
Crooked Lake canal	8
Chemung canal	23
Chemung canal feeder	16
Seneca River improvement	12¼

To Franklin A. Alberger was assigned, in special charge, the Western division of the canals, which embraces the following:

	Miles.
Erie canal, from the county line between Seneca and Wayne counties, to Buffalo, including the Main and Hamburg street canal, slip and basin at the latter place	155
Genesee Valley canal	118
Extension of Genesee Valley canal	7

EASTERN DIVISION.

CANAL REPAIRS.

ERIE CANAL.

The Eastern division of the Erie canal commences at the south end of the Albany basin, and extends to the east bank of the Oneida Lake canal at Higginsville, and includes that part of the Champlain canal beginning at its junction with the Erie canal, extending to the foot of the Mohawk river guard lock, and all the feeders, dams, side-cuts and structures connected with or located upon it.

It is divided into five superintendent or repair sections, all of which were in charge of Robert C. Dorn as superintendent until the twenty-fourth day of January last, when George Heath was appointed superintendent in charge of sections four and five, and Mr. Dorn was continued in charge of sections one, two and three.

SECTION NO. 1—*Robert C. Dorn, Superintendent.*

This section extends from the south end of the Albany basin to the west end of the lower Mohawk aqueduct, and includes the Port Schuyler and West Troy side-cuts, the Champlain canal from the junction to the Mohawk river, the Troy dam, sloop lock, and the pond above, making a total length of nineteen miles.

The structures upon this section are:

Forty-six locks, including two weigh locks; one hundred and eighty-two lock gates; twenty culverts; ten road bridges (wood); eleven road bridges (iron); eleven farm bridges (wood); two towing path bridges (wood); one aqueduct; six waste weirs; one work shop, and two timber sheds.

The repairs of the section were, on the 29th day of February, 1864, let to Spencer Jackson, to take effect on the succeeding 4th of March, and to continue to the first day of January, 1867, at the rate of $39,900 per annum.

Pursuant to chapter 252 of the Laws of 1864 his compensation was increased to $68,628.00 per annum.

REPORT.

STATE OF NEW YORK:
CANAL COMMISSIONERS' OFFICE,
ALBANY, *November 1st*, 1865.

To the Honorable the Legislature of the State of New York:

Pursuant to the provisions contained in the Revised Statutes, the Canal Commissioners submit their

ANNUAL REPORT.

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On the first day of January last the Board consisted of Wm. I. Skinner, B. F. Bruce and F. A. Alberger. The Board was reorganized by the election of Wm. I. Skinner, president, and F. A. Alberger, secretary.

To Wm. I. Skinner was assigned, in special charge, the Eastern division of the canals, which is made up as follows:

	Miles.
Erie canal, from Albany to east bank of the Oneida Lake canal,	136
Champlain canal	66
Glens Falls feeder	12
Pond above Troy dam	3
Black River canal, Black River improvement	98

To B. F. Bruce was assigned, in special charge, the Middle division of the canals, which embraces the following:

	Miles.
Erie canal, from the east bank of the Oneida Lake canal to the county line between Seneca and Wayne counties, including the several feeders and reservoirs	76

	Miles.
Chenango canal, feeders and reservoirs	97
Oswego canal	38
Oneida Lake canal	7
Oneida River improvement	20
Seneca River towing path	5¾
Cayuga and Seneca canal	23
Cayuga inlet	2
Crooked Lake canal	8
Chemung canal	23
Chemung canal feeder	16
Seneca River improvement	12¼

To Franklin A. Alberger was assigned, in special charge, the Western division of the canals, which embraces the following:

	Miles.
Erie canal, from the county line between Seneca and Wayne counties, to Buffalo, including the Main and Hamburg street canal, slip and basin at the latter place	155
Genesee Valley canal	118
Extension of Genesee Valley canal	7

EASTERN DIVISION.

CANAL REPAIRS.

ERIE CANAL.

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It is divided into five superintendent or repair sections, all of which were in charge of Robert C. Dorn as superintendent until the twenty-fourth day of January last, when George Heath was appointed superintendent in charge of sections four and five, and Mr. Dorn was continued in charge of sections one, two and three.

SECTION No. 1—*Robert C. Dorn, Superintendent.*

This section extends from the south end of the Albany basin to the west end of the lower Mohawk aqueduct, and includes the Port Schuyler and West Troy side-cuts, the Champlain canal from the junction to the Mohawk river, the Troy dam, sloop lock, and the pond above, making a total length of nineteen miles.

The structures upon this section are:

Forty-six locks, including two weigh locks; one hundred and eighty-two lock gates; twenty culverts; ten road bridges (wood); eleven road bridges (iron); eleven farm bridges (wood); two towing path bridges (wood); one aqueduct; six waste weirs; one work shop, and two timber sheds.

The repairs of the section were, on the 29th day of February, 1864, let to Spencer Jackson, to take effect on the succeeding 4th of March, and to continue to the first day of January, 1867, at the rate of $39,900 per annum.

Pursuant to chapter 252 of the Laws of 1864 his compensation was increased to $68,628.00 per annum.

Work performed.—The Troy dam was re-planked by the contractor, but leaked so badly that it was deemed advisable to tighten it with a layer of gravel, which not having been done at the original construction of the dam became a charge upon the State.

Iron bridges have been built on Ferry street, in the city of Albany, and Auburn street, in the village of West Troy, and a wooden bridge has been built across the Champlain canal at Cohoes. Fifteen lock gates, twenty-two balance beams and nine mitre sills have been replaced by new. The lower Mohawk aqueduct has been braced anew in twenty-six spans; the sloop lock has been thoroughly repaired, and new piers have been added for its protection against high water. The Albany and West Troy weigh-locks have been largely repaired and considerably strengthened, and new cradles have been built in each.

The bottoms of locks one, eleven, thirteen and seventeen have been concreted and re-planked, with the exception of lock one, which was commenced, but owing to the height of water and the near approach of the time for the opening of navigation, the work was postponed and left unfinished, although a considerable amount of money was expended in attempting to complete it.

The banks of the canal at the West Troy side-cut have been paved in cement; they were constantly washing and filling the channel.

The work of removing the benches between West Troy and lock three has been completed, and that between Albany and West Troy is mostly completed, and will be finished before the opening of navigation.

Work to be performed.—The bottoms of both locks at locks one, four, seven, fourteen, fifteen, sixteen and seventeen, and a single lock at lock eighteen, should be concreted and re-planked to prevent leakage and to make the foundations secure. These locks are among the number which were enlarged before the system of concreting the bottoms was introduced, and they are in such condition that navigation may be suspended at any time by their failure.

An iron bridge should be built on Columbia street, Cohoes; the piers of locks nine, eleven and seventeen must be repaired. The coping and top courses of stone on the piers of the upper Mohawk aqueduct must be relaid, and they should be secured by heavy iron bolts, and about fifty new valves should be put in. These, with the usual and slighter repairs, will put this section in good order.

Detailed Statement of Expenditures by the Superintendent of Repairs on Sec. No. 1, for the fiscal year ending Sept. 30, 1865.

Structures or Works.	No. on Sec.	Cost of new.	Rep'rs of old.	Total.
Locks	44	.....	.....	.....
Weigh locks and offices	2	(W. Troy office.)	$52 05	$52 05
Lock gates	182	.....	.....	.....
Aqueducts	1	.....	.....	.....
Waste weirs	6	.....	.....	.....
Culverts	20	.....	.....	.....
Farm bridges	11	.....	.....	.....
Road bridges, wood	10	.....	.....	.....
Road bridges, iron	11	.....	.....	.....
Towing path bridges	2	.....	.....	.....
Graveling Troy dam	....	.....	.....	3,913 75
Night police	....	.....	.....	244 00
Miscellaneous	....	.....	.....	138 00
One-third of Sup't salary and clerk hire	....	.....	.....	533 33
				$4,881 13

Extraordinary Repairs.

Concreting and replanking bottom of lock No. 11	$3,186 64	
" " " " " 13	4,415 89	
" " " " " 17	1,581 28	
Building coffer dam at lock No. 1, including materials	3,756 43	
		12,940 24
		$17,821 37

SECTION No. 2—*Robert C. Dorn, Superintendent.*

This section extends from the west end of the lower Mohawk aqueduct to the head of lock No. 27, and is thirty-two miles in length.

The structures on this section are :

Eighteen locks ; one guard lock ; one workshop and timber shed ; one dam ; nineteen culverts ; six lock houses ; twenty road bridges (wood) ; three road bridges (iron) ; three aqueducts ; two waste weirs ; sixteen farm bridges ; two towing path bridges.

The contract for the repairs of this section was let to John H. Woodin, from the first day of October, 1864, to the first day of January, 1868, at the rate of $18,000 per annum, and was abandoned by him on the 24th day of March following, because of the very great amount of damage caused by the highwater, he preferring to abandon the contract and forfeit his securities pledged for its performance, rather than proceed with the work. Upon the abandonment of the contract, the State, through the agency of the superintendent, proceeded with the repairs, and the cost of making them, from their extent, has necessarily been very large. The repairs were completed and the section let to Charles A. Donaldson,

from the first day of October, 1865, to the first day of January, 1868, at the rate of $17,740.00 per annum.

Work performed.—Fifteen lock gates and ten mitre sills have been put in, and six other lock gates fitted in readiness to be used as occasion may require. Bridges have been built at Fonda's, John Kline's, Joseph Kline's, Hofman's Ferry, Gardner's and Freeman's, and across the feeder at Rexford flats. The lock bottoms, culverts, and bulkheads and lock gates were considerably repaired before the opening of navigation, and at various times since. The repairs upon the piers and trunk of the Upper Mohawk aqueduct were large and expensive, and those upon the San Sai kill thorough, but less general.

Large quantities of earth were left in the channel of the canal by the freshet in March, and it has been necessary to employ the State dredge during a portion of the season in removing those portions which it had been impossible to remove before the opening of navigation. The canal banks have in many cases been extensively repaired, and in some cases built up from considerably below canal bottom, and where they have been found weak and insecure, they have been protected by rip-rap wall. The feeder level was, for a distance of nearly two miles, seriously damaged, and the towing path washed away from one foot in depth to several feet below canal bottom for the whole distance. The channel of the San Sai kill and the aqueduct across the same were nearly closed by the washings of that stream, and the deposits in the canal from other streams were very large. All that could be done towards the repairs of the section, was done before the opening of navigation, and what remained was completed before the letting of the contract in October last.

The docking along the canal through the city of Schenectady, and for two miles above the city, was this spring, and had for some time previously, been in very bad condition. Such repairs as were absolutely indispensable to the maintenance of navigation were made to it.

The old Rexford flats dam was much damaged by high water, and considerable repairs were made upon it. The new stone dam at Rexford flats is nearly completed, and has, with the coffer dams used in building it, furnished all the water necessary for purposes of navigation during the latter part of the season. It will be completed early next spring. During the past season the Rocky

rift and Schoharie Creek feeders have been largely drawn upon for the supply of this end of the canal.

In pursuance of a resolution of the Canal Board, the bottom of lock twenty-five has been concreted and replanked.

Breaches.—The breach of March seventeenth upon the feeder level was caused by the giving way of the gates in the guard lock at the head of the feeder. The water of the river, which had risen to an unusual height, after breaking down the guard gates, followed down the feeder, tearing its banks in a ruinous manner, into the level below, found its exit into the river, over and through the towing path nearly two miles below. The channel of the canal was in many places nearly filled with the debris, and the towing path for long distances nearly or quite swept away. The repairs were extensive and costly, and were so far completed by first of May as to create no delay in navigation.

On the fourth day of May one span of the upper Mohawk aqueduct gave way and caused a detention in navigation until the 8th. The timber necessary for the repairs was unusual in sizes and lengths, and much difficulty was experienced in procuring it.

On the 11th of May a breach occurred in Norton's dry dock at Vischer's ferry, a boat in the act of entering the lock became jammed between the gates, and they could not be closed until the whole level had run off, a delay of twelve hours was consequent upon it.

On the twelfth day of June a box culvert on the feeder level gave way, and was repaired after thirty hours delay.

Work to be performed.—The bottoms of locks nineteen, twenty, twenty-one, twenty-two, twenty-three, twenty-four, twenty-six and twenty-seven, should be concreted and replanked. They are all in unsafe condition, and many of them unlikely to last another season without it.

The trunk of the upper Mohawk aqueduct, and the docking upon both banks of the canal for two miles west of Schenectady, must be rebuilt before the opening of navigation. Large quantities of timber have already been delivered for that purpose. Two bridges and the culvert at Hoffman's Ferry must also be rebuilt.

Detailed Statement of Expenditures by R. C. Dorn, Superintendent, for the fiscal year ending September 30th, 1865, on Section No. 2, Erie canal.

Structures or works.	New structures.	Repairs of old.	Total.
Locks	.....	$1,064 14	$1,064 14
Culverts	.....	78 25	78 25
Road bridges (wood)	$5,387 07	200 00	5,587 07

Structures or works.	New structures.	Repairs of old.	Total.
Farm bridges (wood)	1,507 98	567 35	2,075 33
Towing path bridge	295 22	.....	295 22
Aqueducts	.....	2,182 08	2,182 08
Waste weirs	.....	32 06	32 06
Feeder dam	.....	1,794 32	1,794 32
Lock tending	.....	.....	6,697 35
Oil for locks	.....	.....	225 00
Lock gates	$7,630 58	$3,596 55	$11,227 13
Repairs of breaches, including damages occasioned by the disastrous spring freshet	.....	24,197 63	24,197 63
Dredging	.....	.....	1,493 76
Timber included in schedule	.....	.....	1,837 50
Schedule of materials, tools, etc., as purchased from the retiring contractor	.....	.....	3,591 80
Ice breakers	.....	16 50	16 50
Repairing and graveling towing path	.....	4,775 67	4,775 67
Cleaning out bottom	.....	1,865 43	1,865 43
Cleaning out creeks	.....	6,099 68	6,099 68
Slope wall	1,514 25	.....	1,514 25
Docking	3,483 52	6,230 92	9,714 44
Protecting sliding bank	.....	305 62	305 62
Miscellaneous	.....	.....	3,121 67
One-third supt. salary and clerk hire	.....	.....	533 34
			$90,325 24

Extraordinary Repairs.

Concreting and re-planking bottom of lock No. 25	3,199 40
	$93,524 64

SECTION No. 3—*Robert C. Dorn, Superintendent.*

This section extends from the head of lock No. 27 to the foot of lock No. 34, and is thirty-seven miles in length.

The structures embraced on this section are:

Fourteen lift locks; three guard locks; ten aqueducts; twenty-nine culverts; five waste weirs; thirty-one farm bridges; eighteen road bridges (wood); six road bridges (iron); one wire suspension foot bridge at Fort Plain; two dams; two work shops, and three lock houses.

The repairs of this section have been placed under contract to Van Slyck & Neff, commencing on the first day of October, and continuing to the first day of January, 1868, at the rate of $16,780.00 per annum.

Work performed.—The dam at Schoharie creek has been completed since the letting of the repair contract. Early last spring, during the high water, a serious breach was threatened near the easterly end, but was happily prevented by filling in with loose stone and brush.

The old boarding house used during the construction of the dam has been converted into a lock house, there being none at that place. The bridge at Fultonville, which was being built at the time of the letting of the contract for repairs, has been completed.

The Rocky Rift-feeder level has been dredged out; it had been filled with sediment from the feeder so as to obstruct the passage of boats and water.

The iron bridge at Canajoharie, and the wooden bridges at Roofs' and Spraker's, have been raised to prevent passing boats from striking them. The sliding and leaky bank on the fourteen mile level has been protected.

The bottoms of locks thirty, thirty-one and thirty-two have been concreted and re-planked, and are in good condition.

Work to be performed.—The vertical walls connected with the wings of the Rocky Rift feeder has been washed away and must be replaced, and one bridge, two bulkheads, and several lock gates must be rebuilt before the opening of navigation.

Detailed Statement of Repairs by the Superintendent for the fiscal year ending September 30th, 1865, on Section No. 3.

Structures or works.	No. on section.	Cost of new.	Repairs of old.	Total.
Locks	12	.....	$78 50	$78 50
Guard locks	3	.....	.....	.....
Aqueducts	10	.....	.....	.....
Waste weirs	5	.....	.....	.....
Culverts	29	.....	.....	.....
Farm bridges (wood)	31	20 10	256 00	276 10
Road bridges (wood)	8	1,590 13	230 18	1,820 31
Road bridges (iron)	6	.....	971 71	971 71
Wire suspension bridge	1	.....	63 72	63 72
Feeders	2	.....	266 75	266 75
Lock houses	4	507 66	.....	507 66
Work shops	2	.....	.....	.....
Lock tending		.....	.....	2,773 76
Schoharie creek feeder and dam		14,292 35	.....	14,292 35
Docking (before the letting)		383 60	.....	383 60
Opening ditches (before the letting)		.....	106 50	106 50
Lock gates		74 72	292 52	367 24
Ice breakers		.....	.....	100 00
Protecting sliding bank		.....	678 72	678 72
Miscellaneous		.....	.....	1,063 73
One-third of sup'ts salary and clerk hire		.....	.....	533 33
				$24,283 98

Extraordinary Repairs.

Concreting and re-planking bottom of lock No. 30	$3,029 69	
do do No. 31	1,146 04	
do do No. 32	1,685 76	
Schoharie creek feeder and dam	733 43	
		6,594 92
		$30,878 90

SECTION No. 4—*George Heath, Superintendent.*

This section extends from the foot of lock No. 34 to the head of lock No. 45, and is twenty-one miles in length.

The following are the structures upon this section:

Twenty-four locks; one guard lock; one hundred and ninety-six lock gates; four aqueducts; seven waste weirs; ten culverts; twenty-four farm bridges (wood); eleven road bridges (wood); two road bridges (iron); one tow path bridge (wood); one draw bridge (wood); one swing bridge (wood); one dam; one feeder with bulkhead; two feeders with guard locks; eight lock houses; two work shops; twelve watch houses; one collector's office.

The contract for the repairs of this section was let to Samuel F. Case from the first day of October, 1864, to the first day of January, 1868, at the rate of $22,900.00 per annum.

Work performed.—A tumble gate has been put in at the head of berm lock thirty-nine. It is a great improvement, and has worked to the entire satisfaction of all who used or seen it.

A stone culvert, with necessary protection and parapet walls, has been built across the towing path at the foot of lock thirty-nine, giving entrance to the new feeder at that place. It is a work which had been long in contemplation and much needed.

The berm abutment of the road bridge at Frankfort has been taken down and rebuilt. Its foundation was lowered two feet, and the height of both abutments raised about two feet, which was made necessary by raising the bridge several years ago on wooden blocks.

At locks thirty-eight, thirty-nine, forty and forty-four, five lock gates have been put in, and at these and various other locks twenty-two combination valves have been put in. A new pier was built at the head of lock thirty-eight, and foot bridges put on at locks thirty-four, thirty-six, forty, forty-one, forty-two and forty-three. The draw bridge over the old feeder at Little Falls has been rebuilt, and docking has been put upon the berm bank of the canal between locks thirty-seven and thirty-eight, and above thirty-nine, for the protection of boats from the rocky shore. The bottoms and culverts of towing path lock thirty-seven, berm lock thirty-nine, and double lock forty-four, have been concreted and replanked. The towing path has been raised and graveled between locks forty-four and forty-five, and forty-one and forty-two, and for about a mile east of lock thirty-six, and has been variously repaired at other places. The bottom and bars have been removed

between locks thirty-five and thirty-six, thirty-eight and thirty-nine, and forty-four and forty-five, besides several smaller amounts at other places. The bridges have been kept in repair, and the condition of the canal has been satisfactory during the season.

Work to be performed.—The waste weir west of lock forty should be rebuilt; much damage to the canal banks by high water might be avoided. The towing path, for half a mile east of lock forty-two, though now of the original height, should be raised to prevent the river at high water flowing into the canal and washing the banks; and the canal bottom, for a quarter of a mile easterly from that lock, should be dredged each season, as it is composed of quicksands and loam, and fills so rapidly that before the close of navigation boats are impeded in passing over it.

Sunken boats.—During the past season five boats have sunk upon this section, one of which caused a detention of two hours; the remainder none. In every case the cause was either the unworthiness of the boats or the carelessness of the boatmen.

Breaches.—The freshet of the sixteenth day of March last seriously damaged the feeder aqueduct at Little Falls. Many of the face stone upon the upper side were knocked out by the ice. The guard bank of the feeder dam on the south side of the river at that place was badly washed and breached. At Mohawk the water from the river ran over the towing path and carried away from two to six feet of the bank for a quarter of a mile, and made a breach in the bank of seventy-five feet wide, and from six to eight feet below bottom. Large quantities of sand and gravel were left in the channel. At a point near Fort Herkimer the flood caused another breach of about one hundred feet in length, considerably below bottom. All the work of repairs upon the section was performed by the contractor, and the cost arrived at by inspectors appointed by the State, who kept an accurate record of the men employed and materials used, so that just and equitable settlement was made under the terms of the contract, which provides that the State shall pay all expenses of repairing a breach beyond $5,000.

Detailed Statement of Expenditures by George Heath, Superintendent on Section No. 4.

ORDINARY REPAIRS.

Items.	Cost of new.	Cost of rep'rs.	Total.
Constructing tumble gate lock 39	$2,603 26	.....	$2,603 26
Docking berm bank below lock 38	1,012 03	.....	1,012 03
" " above " 39	435 67	.....	435 67

Items.	Cost of new.	Cost of rep'rs.	Total.
Concreting bottom and culvert lock 44	1,179 25	.....	1,179 25
" " " " 39	1,020 80	.....	1,020 80
" " " " 37	586 44	.....	586 44
Raising banks and walls lock 37	420 14	.....	420 14
Raising bridge abutment, Frankfort	1,734 00	.....	1,734 00
Rebuilding drawbridge, Little Falls	404 51	.....	404 51
Painting bridges	.....	$240 00	240 00
Lock tending	.....	3,276 67	3,276 67
Watching canals	.....	424 00	424 00
Valves for lock 38	.....	120 00	120 00
Tools	.....	79 36	79 36
Miscellaneous expenditures	.....	382 28	382 28
			$18,418 41
Add one half superintendent's salary and clerk hire			659 99
			$19,078 40

Extraordinary Repairs.

Concreting bottom of lock 45, and construction of drain from lock	$5,026 78		$5,026 78

Detailed Statement of Expenditures by R. C. Dorn, Superintendent, on Sec. No. 4, for the months of October, November, December and January.

Structures or Works.	Cost of new.	Rep'rs of old.	Total.
Locks	.....	$57 79	$57 79
Lock tending	.....	.....	2,170 68
Lock gates	$2,881 29	55 08	2,936 37
Farm bridges, wood	3,451 49	17 07	3,468 56
Road bridges, "	5,583 62	.....	5,583 62
Docking	170 60	.....	170 60
Unpaid bills of Eli Casler, late superintendent	.....	251 50	251 50
Miscellaneous	.....	.....	1,366 40
One half superintendent's salary and clerk hire	.....	.....	125 00
			$16,130 52

SECTION No 5—*George Heath, Superintendent.*

This section extends from the head of lock No. 45 to the east bank of the Oneida Lake canal, at Higginsville, a distance of thirty-four miles. The structures upon this section are as follows: two locks, eight lock gates, one weigh lock, four aqueducts, twenty-nine culverts, four waste weirs, twenty-three farm bridges (wood), six farm bridges (iron), eighteen road bridges (wood), eighteen road bridges (iron), one towing path bridge, two foot bridges (wood), one foot bridge (iron), two lock houses, two work shops, one watch house, five storehouses, two timber sheds, two dams, one collector's office, Utica.

The contract for the repairs of this section was let to E. H. French, from the first day of October, 1864, to the first day of January, 1868, at the rate of $12,000 per annum.

Work performed.—The Bridenbecker bridge, near Frankfort, and Hennesy's bridge, two miles west of Oriskany, have been rebuilt with iron chords, and the Parkhurst bridge, one mile west of Oriskany, has been rebuilt on an improved plan. The slope wall between Frankfort and Utica has been raised about two feet, for two miles, by the former contractor, the expense of which is charged to the repairs of the past year.

The tow path bank near the four mile grocery east of Utica, and east of lock forty-six west of Utica, has been raised considerable distances, and the bottom of the canal near Stacy's basin has also been raised. The trunk of the Oriskany aqueduct has been wholly rebuilt and an extra course of plank put on, and the Whitestown aqueduct has received extensive repairs. The bridge at Darlings has been rebuilt, and that on First street, Utica, which was knocked down by a passing boat, is in progress. A guard bank has been built about three quarters of a mile east of Newville, for the protection of canal banks in high water, and the berm bank at the first culvert east of New London has been strengthened by increasing its width.

The Utica weigh lock has been in bad condition much of the past season. It is now being strengthened and repaired. The towing path between Utica and Higginsville has been graveled and is now in fine condition.

Work to be performed.—The bridges at Willow street, Whitesboro, and at Tefts, must be rebuilt next season. The vertical wall east of the City Mills, Utica, should be considerably extended to accommodate the large number of boats which is almost constantly waiting to unload at that place.

Detentions to navigation.—On the fourteenth day of September a detention of six hours was occasioned by knocking down of the iron bridge at Utica.

Throughout the dryer part of the season there have been frequent detentions on the long level for want of water. Every effort has been made to keep up the water, and the reservoirs on the head waters of the Black river have been drawn upon to a large extent, and have very materially assisted in the maintenance of navigation.

Detailed Statement of Expenditures by Geo. Heath, on Sec. No. 5.

REPAIRS.

Items.	Cost of new.	Rep'rs of old.	Total.
Repairs of Utica weigh lock	.....	$1,192 69	$1,192 69
Painting bridges	$180 00	.....	180 00
Protection bank near Newville	184 75	.....	184 75
Strengthening berm near New London	.....	368 00	368 00
Lock tending	.....	242 67	242 67
Miscellaneous expenses	.....	179 00	179 00
			$2,347 11
Superintendent's salary and clerk hire			233 33
			$2,580 44

Detailed Statement of Expenditures by R. C. Dorn, Superintendent on Sec. No. 5, for the months of October, November, December and January.

Structures or Works.	Cost of new.	Rep'rs of old.	Total.
Farm bridges, wood	$1,711 24	$150 00	$1,861 24
Road " "	3,685 79	141 68	3,827 47
Unpaid bills of Eli Caasler, late superintendent	.....	216 39	216 39
" " John Beardslee, "	.....	56 67	56 67
Lock tending	.....	.....	180 64
Miscellaneous	.....	327 13	327 13
One half of superintendent's salary and clerk hire	.....	.....	125 00
			$6,594 54

The following are the amounts expended on the Eastern Division of the Erie canal for a series of years past.

YEAR.	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.	Sec. 6.	Total.
1851	$74,632 71	$27,317 17	$40,073 38	$30,451 95	$26,937 64	$23,289 89	$222,702 54
1852	136,016 49	47,858 59	51,651 16	35,904 45	33,288 04	24,171 07	328,889 80
1853	101,124 60	32,101 88	44,403 64	33,128 69	29,602 41	35,803 29	276,164 51
1854	75,298 10	42,256 86	61,674 97	46,187 95	29,099 71	44,120 44	282,642 82
1855	57,875 36	63,016 64	76,597 47	42,361 22	32,354 39	28,125 13	300,330 21
1856	42,954 22	27,181 56	49,232 00	44,436 55	40,147 81	24,489 52	228,441 66
1857	46,113 36	17,953 21	21,990 18	35,598 80	29,922 29	14,291 32	165,869 16
1858	46,630 34	28,398 85	25,876 28	35,831 81	27,260 04	.....	163,997 32
1859	102,000 64	26,166 15	37,766 71	26,969 66	22,842 36	.....	215,745 52
1860	41,054 96	25,551 84	13,611 45	10,679 26	19,417 25	.....	110,314 76
1861	41,797 56	20,261 52	14,598 23	13,444 52	10,177 80	.....	100,279 63
1862	40,879 98	20,365 37	20,672 18	16,187 01	10,975 99	.....	109,080 53
1863	43,744 56	25,246 02	47,505 71	20,960 89	11,413 74	.....	148,870 92
1864	55,490 92	28,769 27	102,167 73	31,491 76	23,874 36	.....	241,794 04
1865	103,482 11	136,633 75	37,074 71	69,406 86	35,321 92	.....	381,919 35

CHAMPLAIN CANAL.

This canal, commencing at the foot of the guard lock on the Mohawk river, and extending to Whitehall, including the Glens Falls feeder, is divided into three superintendent or repair sections. The whole length of the canal is about seventy-six miles. The repairs of this canal, since the twenty-seventh day of January, 1864, have been in charge of Alonson Welch on section one, and James H. Sherrill on sections two and three, as superintendents.

SECTION NO. 1—*Alonson Welch, Superintendent.*

This section extends from the south end of the guard lock at Cohoes to the south end of the first lock north of Ft. Miller bridge, and is twenty-eight miles in length.

The section was let to Samuel G. Hart at the rate of $25,800 per annum, commencing 1st Oct., 1864, continuing to 1st Jan., 1868.

The structures upon the section are:

Twelve locks; one weigh lock; one aqueduct; eleven waste weirs; eight culverts; two work shops; one lock house and collector's office; one timber shed; two dams (one across Hudson and one across Mohawk river); one watch house and collector's office; five foot bridges; two bridges at Waterford; one store house; thirty-six farm bridges; twenty-eight road bridges; seven towing path bridges; seven lock houses; one watch house.

Work performed.—All the work properly chargeable to the repair fund upon this section has been performed by the contractor.

Two piers to the Mohawk river bridge at Cohoes have been rebuilt, and the third has been protected by a new ice breaker. These piers were considerably damaged by the ice last spring. Three lock gates have been put in at locks six and nine. The abutments, wings, walls and approaches of the bridges on Main and Division streets, Waterford, and the approaches to bridges at Fitzgerald's, Johnson's, Wilcox's and Bleeker's have been raised so as to permit the passage of large boats under them, so that

boats from the Erie canal may discharge their loads at Waterford and Cohoes without reshipping, as has been the practice. The sides of the wooden combined locks, however, have been so pressed in by the action of the frost that the largest class boats have been unable to reach those places. An attempt to increase the width of those locks was made by trimming off the walls of the lower lock from one to four and one-half inches, and leaving off one course of the lining plank. This was found insufficient, and other means must be devised to increase the width still more.

The dam across the Hudson river has been raised to increase the depth of water on the sixteen mile level. Snubbing posts have been set at the Waterford weigh lock, and on the side-cut below the lock.

Work to be performed.—The Hudson river dam must be thoroughly repaired or rebuilt the coming season.

Sunken boats.—An old and heavily laden lumber boat sank at Schuylerville on 15th July, but was removed without detention to navigation.

Statement of Expenditures by Alonson Welch, Supt., Section 1.

REPAIRS.

Items.	Cost of new.	Repairs old.	Total.
Raising bridge approaches	$1,334 50	.....	$1,334 50
Repairs superintendent's office	.....	$40 00	40 00
Repairs work shop	.....	236 00	236 00
Bracketing dam	.....	480 35	480 35
General repairs, assisting navigation, etc	.....	2,285 22	2,285 22
			$4,376 07
Superintendent's salary and clerk hire			1,390 00
			$5,765 07

SECTION NO. 2—*James H. Sherrill, Superintendent.*

This section extends from the south end of the first lock north of Fort Miller bridge to Dunham's basin, and includes the Glens Falls feeder and the pond above—in all twenty-four miles in length.

The repairs of this section were let to Harvey Church at the rate of $19,400 per annum from the first day of October, 1864, to the first day of January, 1868.

Upon this section the structures are as follows:

Nineteen locks; seven waste weirs; nineteen farm bridges; three towing path bridges; one work shop; one dam across the Hudson river, (nine hundred feet long); three aqueducts; nine culverts; seventeen road bridges; ten lock houses; one store house.

Work performed.—The Glens Falls feeder dam has been protected by a vertical wall in cement along the shore where it was being undermined. The lock house at Fort Edward has been converted into a collector's office and a new lock house built. The towing path on the two, one, five and twelve mile levels has in many places been raised and graded. Two lock gates have been put in at the Moseskill lock and three upon the Glens Falls feeder. A measurer of boats has been kept at Fort Edward, and has prevented the usual crowds and delays at that place.

The prism of the Glens Falls feeder has been widened, the seams concreted in many places, and a vertical wall upon the towing path side has been built through the village of Glens Falls. The spans and height of several bridges have been increased, and in the village one wooden bridge has been replaced by an iron superstructure. Quite an amount of work has been done on the improvement of the Champlain canal, under chapter 186 of the Laws of 1864, which is elsewhere referred to.

Work to be performed.—The Moseskill and Fort Miller locks have been in dangerous condition for a long time, and have been mentioned in other reports. They must be rebuilt, and it is desirable that some provision be made by the Legislature at the present session. The lock at the head of the feeder should be rebuilt, increasing the water way. Before the completion of the improvement of the Champlain canal quite a number of road and farm bridges must be rebuilt, increasing their spans and heights, and the capacity of the waste weir on the nine mile level must be increased.

The docking has been crowded into the canal in a number of places and is unsafe; it should be taken up and repaired. The sluices around the locks on the Glens Falls feeder should be enlarged.

Sunken boats.—A boat during the winter rested on a stone upon canal bottom and sprung a leak when the water was let into the canal. No delay to navigation was caused.

Statement of Expenditures by Jas. H. Sherrill, on Section No. 2.

Items.	Cost of new.	Repairs.	Total.
Improvement, construction bridges on Glens Falls feeder	$16,160 69	.....	$16,160 69
Towing path bridge	400 00	.....	400 00
Construction bridge abutment, Coleman's	555 00	.....	555 00
Dam, Glens Falls feeder	2,638 35	.....	2,638 35
Slope wall, Fort Edward lock	389 87	.....	389 87
Measuring boats	.....	$555 00	555 00
Watching canal	.....	1,451 07	1,451 07
Miscellaneous accounts	.....	886 63	886 63
			$23,281 61
Superintendent's salary and clerk hire			1,358 33
			$24,639 94

SECTION No. 3—*James H. Sherrill, Superintendent.*

This section extends from Dunham's basin to Whitehall, a distance of twenty-two miles. The repairs of this section were let to Henry D. Denison, from first of August, 1864, to the first of January, 1867, at $7,500 per annum. The annual compensation, under chapter 252 of the Laws of 1864, was increased to $12,000 from the first day of August, 1864.

The following are the structures upon it:

Eight locks, three culverts, five waste weirs, seven road bridges, twenty farm bridges, four towing path bridges, five small dams on Wood creek, four lock houses.

Work performed.—The contractor for repairs upon this section has performed all the work done upon the section except taking down an old bridge at Whitehall, which was done by the superintendent.

Work to be performed.—The usual amount of repairs, besides that necessary to the docking, which is considerable, is all that will be necessary to put the section in good order.

This portion of the Champlain canal should be improved in many places, under the general act for the improvement. The middle dam on Wood creek should be rebuilt, and its outlet increased in size.

The bridges at Whitehall and Brayton's should be rebuilt, so as to increase their heights and spans, and the waste weir at Dunham's basin should be enlarged.

The following are the amounts expended on the Champlain Canal for repairs during a series of years past.

YEARS.	Section 1.	Section 2.	Section 3.	Total.
1851	$23,870 27	$16,844 49	$10,252 07	$50,966 83
1852	37,611 43	19,246 62	18,660 96	75,519 01
1853	38,225 47	18,791 71	21,946 18	78,963 36
1854	31,025 06	24,894 34	16,663 01	73,463 48
1855	48,756 85	24,083 28	17,543 08	90,383 21
1856	21,191 60	11,647 30	12,535 30	45,374 20
1857	54,357 76	9,574 78	8,707 77	72,640 31
1858	42,386 75	24,561 20	14,111 21	81,059 16
1859	37,306 00	15,726 39	11,843 37	64,875 76
1860	26,997 46	16,621 80	12,401 70	56,020 96
1861	12,305 84	11,488 99	4,952 97	28,747 80
1862	16,752 47	10,666 85	8,668 22	36,087 54
1863	27,673 30	11,495 96	13,795 20	52,964 46
1864	27,021 63	22,310 09	10,884 79	60,216 51
1865	45,042 85	29,448 48	18,552 54	93,043 87

BLACK RIVER CANAL.

The Black River canal extends from Rome to Lyons Falls, a distance of thirty-six miles; and there are connected with it, and forming part of its navigable length, the Delta feeder, navigable for one and a quarter miles; Boonville feeder, navigable for ten and a half miles; the river above Forestport dam navigable for two miles; improvement of the Moose river above Lyons Falls dam, one and a half miles, and the improvement of the Black river, forty-two and a half miles, making a total navigable length of ninety-three and three quarter miles.

The canal and river improvements are divided into three superintendent or repair sections.

Oscar L. Wetmore was appointed superintendent on the twenty-fourth day of January last, in charge of the whole canal, and on the sixth day of April last Hawley J. Goodwin was appointed to fill the vacancy caused by the resignation of Mr. Wetmore.

Section No. 1.

This section extends from the junction of the Black River canal with the Erie canal, at Rome, to a point one thousand feet north of lock No. 70, and is about twenty-four miles in length.

The following are the structures upon this section:

Seventy lift locks, one guard lock, ten culverts, two draw bridges across Delta feeder, nineteen lock houses, one aqueduct over Rome and Ogdensburgh railroad, eighteen farm bridges, two farm bridges owned and supported by individuals, one dam across Lansing-kill, five waste weirs, fifteen road bridges, two road and change bridges, five aqueducts.

The contract for the repairs of this section was let to Edward H. Edwards, for the term of four years and eight months, commencing May 1st, 1861, at $8,700 per annum. The annual compensation of the contractor was, pursuant to chapter 252 of the Laws of 1864, increased to $13,050.

Work performed.—A dam has been constructed across the Mo-

hawk river at Delta. A road bridge of increased width of roadway has been constructed above lock sixteen, a portion of the cost of which was paid by the State. Buskin's farm bridge, and a road and change bridge at Hillside, below lock thirty-five, have been rebuilt, and twenty-one lock gates have been put in. A large amount of bottoming-out has been done upon this section during the spring repairs. A large number of bars had been formed in the channel, and the sliding of the banks had in several instances nearly filled it.

The towing path between locks twenty-three and sixty-four, a distance of nine miles, has been well repaired, and it has been raised and graveled at numerous other places. The old structures have been repaired in various ways so as to make them usable. Some bridges have been replanked and many lock gates mended.

Work to be performed.—Most of the lock gates should be rebuilt, and nearly all the mitre sills should be put in anew. The locks are worked with difficulty because of the leakage of the gates and about the mitre sills. The bridges below each of locks seven, twelve, sixteen, twenty-nine and seventy, and the change bridge below lock ten should be rebuilt. Many of the farm bridges will require repairs.

Sunken boats.—Seven boats have sunk upon the section, one of which sank because of striking a stone on the bottom; another by the giving out of the lock gates, and three which were abandoned by the owners as worthless. All were promptly removed, and no material detention to navigation was caused.

Section No. 2.

This section commences at a point one thousand feet north of lock No. 70, and extends to the junction with the Black river at Lyon's Falls, a distance of twelve miles. It includes the Boonville feeder to Forestport, a distance of ten and a half miles; also, the river above the dam at Forestport, some two miles in length, and the Moose River improvement above the dam at Lyon's Falls, one and one-half miles long.

The contract for the repairs of this section was let to Benjamin F. Maxson for the term of five years, commencing March 1, 1861, at $4,178 per annum.

In pursuance of chapter 252 of the Laws of 1864, the compensation of the contractor has been increased to $6,276 per annum.

The following are the structures upon this section:

Thirty-nine lift locks, one guard lock, thirteen lock houses, one aqueduct, six waste weirs, ten culverts, two dams, sixteen road bridges, twenty-two farm bridges, one farm and change bridge, one road and change bridge, one towing path bridge.

Work performed.—The road bridges at Butts', Davis' below Port Leyden, Lyons' Falls dock, and over the guard lock at the head of the feeder, and the farm bridges at Grossman's, Pitchard's, over the feeder, and Lewis', below Port Leyden, have been rebuilt by the contractor. Three of the bridges were built upon an improved plan and the extra expense was paid by the State. The towing path has been raised nearly the whole length of the section, and the locks have been kept in workable order and the canal in navigable condition.

Work to be performed.—Some six or eight bridges must be rebuilt the coming season, and the lock gates will need considerable attention. The docking at Lyon's Falls must be overhauled next spring.

On the short level above Hulbert's mill the short level above the Sugar river combines, and on the flow level are a number of sink holes through the rock in canal bottom, through which large quantities of water escape and are lost. They have several times been covered with gravel to prevent leakage, but as that only partially and temporarily remedies the evil the seams should be concreted and the remedy will be perfect.

Breaches.—On the twenty-seventh day of September last a portion of the waste weir above lock seventy-one, at Boonville, was carried out. It was promptly repaired and occasioned a delay of about twenty-four hours.

The Reservoirs.

The principal supply of water for the Black River canal, and a large amount for the Erie canal, is furnished every season by the Black river; and to make this source of supply unfailing, three reservoirs have been constructed upon its headwaters, to be drawn upon as occasion should require.

These reservoirs are known as North and South Branch, and Woodhull reservoirs. They are situated in an almost unbroken wilderness, and employ one man in taking care of them. During the past season the valves have been renewed, and about sixty feet of docking has been relaid at Woodhull. The road leading to the reservoirs from Dawson's had become so overgrown with brush, and the wooden causeways upon it so decayed, that the road was almost impassable. It has been chopped out and repaired, and the trail from South branch to Woodhull reopened. The well at South branch has been recovered with timber, and a new bridge has been built at North branch chute. There were only about nineteen feet in depth of water remaining in Woodhull reservoir at the beginning of the season, owing to the leakage through the defective valves, while the others were full. They have all been largely drawn upon during the season, for the supply of both the Black River and the Erie canals, and the amount furnished to the long level of the Erie was so large as to hinder navigation on the Black river to some extent.

Section No. 3.

This section includes the Black River improvement from Lyon's Falls to Carthage, a distance of forty-two and a half miles, the repairs were contracted for by Ward & McVickar for $3,800 per annum, to November 1st, 1864; and pursuant to chapter 252 of the Laws of 1864 their compensation was increased to $7,500 per annum from 1st August, 1864. On the expiration of the contract the repairs of the section were advertised and let to the same contractors from the first day of March, 1865, to the first day of January, 1869, at $9,750 per annum.

The following are the structures upon this section:

One road bridge at Carthage, one draw bridge at Beach's, one draw bridge at Illingsworth's, one draw bridge at Carter's, one draw bridge at Tiffany's, one dam and lock at Otter creek, dam at Carthage.

Work performed.—A bridge has been built across the Black river at Lyon's Falls under chapter 174, Laws of 1864, and was paid for by the State. The bridge superstructure across the Black river at Carthage has been rebuilt of iron upon the plan

known as King & Trees' wrought iron tubular truss. It is four hundred and seventy-five feet in length, and consists of seven spans of from thirty-six to seventy-two feet each. The draw bridges at Beach's and Illingsworth's have been raised and larger wheels put under the draw; they work much easier.

All the structures, which are but few, have received the necessary repairs, and navigation would have been uninterrupted but for the great drouth of the season, and the necessity of supplying the lower sections of this canal, and the long level of the Erie, from the waters gathered up in the reservoirs.

The following are the amounts expended on the Black River canal and Black River Improvement, for repairs, for a series of years past.

YEARS.	Section 1.	Section 2.	River improvement.	Total.
1851	$7,127 35	$15,574 18	.....	$22,701 53
1852	8,370 56	22,240 37	.....	30,610 93
1853	6,895 85	19,324 03	.....	26,219 88
1854	12,321 43	16,256 82	.....	28,578 25
1855	9,347 28	24,514 40	.....	33,861 68
1856	4,826 55	12,377 18	.....	17,203 73
1857	3,935 08	9,860 97	.....	13,796 65
1858	3,999 00	14,622 75	.....	18,621 75
1859	8,107 70	16,818 03	.....	24,925 73
1860	4,821 54	14,724 85	$2,741 55	22,287 94
1861	9,962 37	9,639 59	3,799 92	23,401 88
1862	11,982 98	4,995 35	7,651 31	24,629 64
1863	10,456 35	5,455 16	4,043 34	20,454 85
1864	12,034 37	5,418 65	4,193 47	21,646 47
1865	24,084 18	9,107 66	16,617 92	49,809 76

GENERAL REMARKS.

Repairs of the Erie.

The work which has been done chargeable to this fund, beyond that which properly is the duty of the repair contractors, and that which has been done by the superintendents of repairs, is as follows :

The scales of the weigh locks at Albany and West Troy have been thoroughly repaired, and the iron work has been strengthened to make the scales capable of sustaining the weights placed upon them. The cradles have been rebuilt so that no part raises above the mitre sills of the locks. The trusses upon which the weights rest have been rebuilt and new scale beams put in.

At the upper side-cut a short piece of vertical wall has been put in on the berm side opposite the entrance of a private basin.

The floods of last March raised the water in the Schoharie creek to such height that it ran around the east abutment of the dam and partially undermined it. A protection of loose stone and brush was put in, and further damage was prevented by the prompt and efficient efforts of the repair contractors.

The abutments of four bridges upon the Rocky Rift feeder have been raised two feet and new superstructures on an improved plan put on.

A stone culvert has been built over the entrance of the new feeder at Little Falls into the canal, and the embankments, vertical and slope walls raised to a proper height, and suitable protection and parapet walls constructed.

A "tumble gate" has been put in at the head of lock thirty-nine in place of the old mitre gates. It opens up stream by dropping down into the lock below the breast wall, so that boats pass over it. It is hung upon cast-iron journals on a wooden quoin post with sockets let into the lock walls, and turns upon a wooden hollow quoin laid horizontally across the lock. The gate is loaded with stone so that it sinks quickly and is raised by chains connected with gearing at the side of the lock. The mitre sill wall is entirely removed and an open frame work of timber substituted, upon which the hollow quoin rests. A platform extends from the hollow quoin to the breast wall supporting the valves, which are

placed horizontally, leaving a well beneath eight or ten feet in depth of the whole width of the lock, into which the water is discharged and passes from it through the open frame work into the chamber of the lock. A wooden truss has been placed upon the upper face of the gate to prevent it from injury from boats which might strike it when moving down stream, and a "bumping beam" has been placed across and in the lock to protect it from boats ascending. The valves, though laying horizontally, are worked in a manner similar to the old valves, but from the side wall of the lock and not from the gate, as was the former practice. The valves are subject to less wear and tear than in the old gates, as they are disconnected, and do not suffer from the slamming of the gates when brought together. There is much less commotion in the lock while filling, and the boats rise steadily and upon an even keel with but little surging. A single set of machinery for the raising of the gates would answer for double as well as for single locks, and could be tended by one man as well as the old gates were by two. The cost of inserting "tumble gates" is moderate, and the expense of keeping them in repair much less than the mitre gates. The general insertion of such gates throughout the canal would be a great improvement and a great saving in expense. It would cost less to tend them, and the gates themselves would outlast two or three sets of the old ones, and the comparative original cost of the two is much in favor of the new, as per the following estimates of D. C. Jenne, Division Engineer.

The accompanying drawing will perhaps more fully explain the manner of construction than I find it possible to do in words alone.

Estimate of the cost of altering lock and building tumble gate, including machinery for operating and valves and fixtures for a lock of ten and a half feet lift.

	Removing old gates, mitre sills, platform, etc	.....	$50 00	
20	cubic yards, removing mitre sill platform wall	$2 00	40 00	
5,500	feet boards measure white oak timber	80 00	440 00	
2,850	" " hemlock timber	35 00	99 75	
2,500	pounds wrought iron	20	500 00	
320	" cast iron	12	278 40	
120	" chain (English proof)	20	24 00	
50	" spikes and nails	12	6 00	
4	composite valves, inserted	40 00	160 00	
	Machine labor on gearing, pullies and journals	.....	50 00	
	Inserting gate	.....	35 00	
	Total	.....	$1,683 15	
	Say			$1,680 00

Estimate of the cost of rebuilding upper gates, including all iron valves and fixtures for a lock of ten and a half feet lift.

	Removing old gate	.....	$25 00	
3,720	feet board measure, white oak	$80 00	297 60	
250	" " " pine	60 00	15 00	
1,882	pounds wrought iron	20	376 40	
620	" cast iron	12	74 40	
50	" spikes and nails	12	6 00	
4	composite valves, inserted	40 00	160 00	
	Inserting gates in lock	.....	50 00	
	Total		$1,004 00	
	Say			$1,000 00
	Difference in cost			$680 00

Estimate of the cost to rebuild a tumble gate, including new iron, but not including new valves and fixtures, for a lock of ten and a half feet lift.

	Taking out old gate	$15 00	$15 00	
2,080	feet board measure white oak timber and plank	80 00	166 40	
582	pounds wrought iron	20	116 40	
50	" spikes and nails	12	6 00	
	Inserting gate in lock	.....	35 00	
	Total		$338 80	
	Say			$340 00

Estimate of the cost to rebuild the upper gates, including new iron, but not including new valves and fixtures, for a lock of ten and a half feet lift.

	Taking out old gates	$25 00	$25 00	
3,720	feet board measure white oak timber, etc	80 00	297 60	
250	" " " pine plank	60 00	15 00	
1,007	pounds wrought iron	20	201 40	
50	" spikes and nails	12	6 00	
	Inserting valves and fixtures	.....	50 00	
	" gates in locks	.....	50 00	
	Total		$645 00	
	Say			$650 00
	Difference in cost			$310 00

NOTE.—A tumble gate will probably last as long as two sets of gates on the old plan now in use on canals with a large amount of business.

The berm abutment of the Frankfort road bridge has been taken down and the foundation sunk two feet, and both it and the towing path abutment were raised two feet with stone, instead of the wooden blocks, which were put in when the bridge was formerly raised.

The Bridenbecker bridge near Frankfort, and Hennesey's bridge, have been rebuilt with iron chords, and the Parkhurst bridge, one mile west of Oriskany, has been built on a new plan.

The former repair contractor on section five raised the slope

wall about two feet, nearly two miles, between Frankfort and Utica; the towing path near the four mile grocery and east of lock forty-six, and has excavated the bottom of the canal near Stacy's basin. It was paid for the present year.

The trunk of the aqueduct at Oriskany was rebuilt by the contractor, and an extra course of planking added by direction of the Commissioner.

The banks at the sloop lock at Troy were considerably damaged by the high water of last spring. They were repaired and protected by a wall of quarried stone laid edgewise in cement.

Extraordinary Repairs of Erie.

The improvement between locks one and two, for the removal of the benches and the construction of a vertical wall, has been completed from Ferry street bridge, in the city of Albany, to the upper slip in the lumber district, and a portion of that between that slip and lock two has been finished: the remainder it has been impossible to finish, because of the backing up of the Hudson river in high water. The portion which is completed is a great benefit to navigators, and to the commercial interests of Albany in that portion of the city. Under chapter 499 of the Laws of 1865 the cost of this work will be increased about seventy per cent.

The removal of the benches between lock three and the upper side-cut has been completed, and the former jams and crowds which were so frequent have been avoided, as the canal is now of sufficient width to allow four of the largest class to lay abreast. By chapter 524 of the Laws of 1865 the cost of the work has been increased about fifty per cent.

The iron bridge on Ferry street, Albany, has been completed, and its abutments have been raised. It is of one hundred and ten feet span, and has two roadways of twelve and one half feet each, and is a beautiful and permanent structure.

The work of concreting the foundation of lock one was commenced, but had to be left incomplete because of the high water in the river.

The work of concreting the bottoms of locks eleven, thirteen, *seventeen,* twenty-five, thirty, thirty-one, thirty-two and forty-five

has been completed, except at lock forty-five, which will probably require some further work before it will be in perfect order, as the masonry in the berm lock has settled. The work of concreting the bottoms of the locks above mentioned has been entirely satisfactory, and no trouble has been experienced from them.

The stone dam at Rexford Flats is not yet completed, but will be completed before the opening of navigation. About four hundred and seventy-five feet are now completed, and about eighty feet more of the foundation is put in. The coffer dam is built across the gap, so that the water runs over that portion of the dam already completed, and the canal during the later part of the season has received the full benefit of the dam. Under act, chapter 491 of the Laws of 1865, the Canal Board made an allowance of about one hundred per centum on the original prices.

The road at Bridenbecker's, near Frankfort, has been completed.

CHAMPLAIN CANAL.

The work performed upon the Champlain canal during the past season has been chargeable to and payable from three several funds or appropriations: the "Repairs," the "Extraordinary Repairs," and the "Improvement of the Champlain." Of the "Repairs" I have already spoken.

Extraordinary Repairs.

The lock at Fort Edward, which was being built at the time of the last report, was completed and brought into use last spring. The work was well done and the new lock is a valuable improvement. Under a special act of the Legislature of last winter the Contracting Board awarded the contractors the sum of $10,968.84, which was deemed an equitable allowance for the increased cost of materials and labor between the time of entering into contract and the performance of the work.

Improvement of the Champlain.

Under and in pursuance of the act of the Legislature, chap. 186 of the Laws of 1864, by which a tax was levied and the sum of $295,000 was appropriated for the improvement of the Champlain

canal, and that work authorized, and the sum of $150,000 set apart for immediate use, the following work has been put under contract, and has either been completed or is in progress.

On the twenty-eighth day of December, 1864, the following work was put under contract:

The construction of a sluice around the north guard lock at Cohoes.

The improvement of the canal and entrance at Waterford weigh lock.

The improvemment of the channel of the canal at Stillwater.

The improvement of the channel at Bemis Heights.

The enlargement of the aqueduct at Schuylerville.

The construction of a sluice around the guard lock at Saratoga dam.

The construction of a tree dam on Wood creek, six miles south of Whitehall.

All of which have been completed, except the sluice around the Saratoga dam, the bulkhead of which is still unfinished, and the tree dam on Wood creek. The berm abutments of four bridges between Flinn's lock and Coveville, and two included in the contracts at Stillwater and Bemis Heights, and four between Fort Edward and Whitehall, have been taken down and rebuilt and new superstructures put upon them of increased length. A considerable amount of work was done by the superintendent last spring in widening the canal between Hewit's lock and Coveville, by removing the inner angles at the bottom.

The State steam dredge has been employed two months widening the canal south of Mechanicsville. Last spring a contract for widening the canal near Basset's lock was let, and is about half completed.

A small portion of the work for widening the rock-cut near Moseskill, and some part for widening the canal bottom between Fort Edward and Fort Ann, has been done by the superintendent.

A considerable amount of work has been done in stopping the leaks of the Glens Falls feeder, by and under the direction of the superintendent. The bridges at Haverland's and Glens Falls have also been rebuilt. This work will progress during the winter.

The improvement of the side-cut at Waterford will be commenced as soon as navigation is closed, and will be completed before spring.

Since the close of the last fiscal year all the remaining work

provided for by the Legislature for the improvement of the Champlain canal has been put under contract, and the entire amount of the appropriation for that purpose has been dedicated to specifically contracted work. A large portion of the improvement will be completed before navigation next season.

Improvement of the Black River.

The Legislature of the last and preceding years passed acts for the improvement of the Black river by the construction of a dam and lock between Otter creek and Carthage, leaving the immediate location to be fixed by the Canal Board. The location has been made at a point about three miles above Beach's bridge.

This location was made in preference of others because of the large amount of land damages saved, and it was thought more economical to dredge the river below than pay the damages which would arise from locations further down the stream; and in case of very low water it is designed to raise the dam at Carthage a foot by means of flush boards. It has been placed under contract, the work to be finished before the first day of September next.

The pier at Otter creek, recommended by the Canal Board, and referred to in the report of last year, is under contract and will be finished during the winter.

TABLE No. 1.

Statement showing the character of work, estimated cost, amount of work done during fiscal year, whole amount done, and amount remaining to be done under contracts existing during the fiscal year ending September 30th, 1865, on the Eastern Division of the New York State canals.

Character of work.	Estimated cost.	Am't done during fiscal year.	Whole am't done.	Am't remaining to be done.
REPAIRS OF THE ERIE CANAL.				
Iron superstructures at Ferry street, Albany, and over Port Schuyler side cut; also over upper side cut at West Troy, with work connected	$12,996 48	$5,216 48	$12,996 48	Settled.
EXTRAORDINARY REPAIRS OF THE ERIE.				
Removal of benches and slope wall and the construction of a vertical and slope wall between locks Nos. 1 and 2	$29,000 00	$8,420 00	$23,680 00	$5,320 00
Allowance by Canal Board under act, chapter 499, Laws of 1865	21,025 00	6,815 00	17,160 00	3,865 00
Removal of benches and slope wall and the construction of a vertical wall from the upper side cut at W. Troy, to lock No. 3	26,984 51	9,364 51	26,984 51	Settled.
Allowance by contracting board under act, chapter 524, Laws of 1865,	12,023 73	3,213 73	12,023 73	Settled.
Stone dam across the Mohawk river at Rexford flats	23,000 00	10,490 00	13,390 00	9,610 00
Allowance by Canal Board under act, chapter 491, Laws of 1865	23,000 00	10,490 00	13,390 00	9,610 00
Total	$135,033 24	$48,793 24	$106,628 24	$28,405 00
EXTRAORDINARY REPAIRS CHAMPLAIN.				
Rebuilding on enlarged plan, lock No. 13, at Fort Edward	$24,697 86	$6,617 86	$24,697 86	Settled.
Allowance by contracting board under act, chapter 489, Laws of 1865,	11,502 00	3,355 20	11,502 00	Settled.
Total	$36,199 86	$9,973 06	$36,199 86	.....
IMPROVEMENT CHAMPLAIN CANAL.				
Sluice around no. guard lock, Cohoes	$2,890 89	$2,890 89	$2,890 89	Settled.
Improvem't at Waterford weigh lock,	8,873 32	8,873 32	8,873 32	do
do Stillwater	4,541 93	4,541 93	4,541 93	do
do Bemis Heights	3,826 84	3,826 84	3,826 84	do
Enlarging Schuylerville aqueduct	9,056 76	9,056 76	9,056 76	do
Improvement at Bassett's lock	4,500 00	2,000 00	2,000 00	$2,500 00
Sluice around guard lock Saratoga dam	4,500 00	2,700 00	2,700 00	1,800 00
Tree dam on Wood creek	13,720 00	13,020 00	13,020 00	700 00
Total	$51,909 74	$46,909 74	$46,909 74	$5,000 00
REPAIRS OF BLACK RIVER.				
Bridge over Black river at Lyons' Falls	$12,996 58	$12,996 58	$12,996 58	Settled.
IMPROVEMENT OF BLACK RIVER.				
Lock & dam 3 m. above Beach's bdg.	$58,000 00	.....	.....	$58,000 00
Grand total	$307,135 90	$123,889 10	$215,730 90	$91,415 00

TABLE No. 2.

Statement showing character of work, estimated cost, and amount paid on work not under contract, on the Eastern Division of the New York State canals, from October 1st, 1864, to October 1st, 1865, as performed under the supervision of the Engineers.

Character of work.	Estimated cost.	Amount paid.
MISCELLANEOUS REPAIRS ERIE CANAL.		
Vertical wall at West Troy side cut	$125 00	$125 00
Repairing scales to weigh lock, Albany	1,762 66	1,762 66
do do do West Troy	2,513 46	2,513 46
Planking weigh lock at Albany	360 68	360 68
do do West Troy	356 40	356 40
Paving top of banks at sloop lock, Troy	4,405 50	4,405 50
Repairing foundation to lock No. 7	625 00	625 00
Raising bridge abutments and building new superstructures to four bridges on Rocky Rift feeder (difference)*	697 62	272 02
Building culvert for feeder at Little Falls	3,191 94	3,191 94
Building tumble gate at head of berm lock No. 39	2,603 26	2,603 26
Taking down and relaying berm abutment, and raising both abutments and approaches 2 feet to road bridge at Frankfort	1,734 00	1,734 00
Rebuilding Bridenbecker's bridge, near Frankfort, with iron chords (difference)*	845 19	406 65
Constructing slope wall between Frankfort and Utica	1,814 50	1,814 50
Raising tow path at Four-Mile Grocery, east of Utica	75 00	75 00
do do east of lock No. 46, West Utica	246 00	246 00
Rebuilding Parkhurst bridge near Oriskany, new plan (dif.)*	673 03	215 82
do Remsey's do iron chord (difference)*	812 24	373 07
Extra lining floor to Oriskany aqueduct	185 50	185 50
Excavating bottom of canal at Stacy's basin	355 20	355 20
Total	$23,382 15	$21,621 06
EXTRAORDINARY REPAIRS OF THE ERIE CANAL. ACT, CHAPTER 311, LAWS OF 1863.		
Location of road at Bridenbecker's, near Frankfort, act, chap. 275, Laws of 1863	$1,500 00	$1,500 00
Concreting foundation of lock No. 1	5,000 00	3,756 43
do do do 11.	3,200 00	3,186 64
do do do 13	5,100 00	4,415 89
do do do 17	1,581 28	1,581 28
do do do 25	3,200 00	3,199 40
do do do 30	3,200 00	3,029 69
do do do 31	1,146 04	1,146 04
do do do 32	1,685 76	1,685 76
do do do 45	5,000 00	5,026 78
Total	$30,613 08	$28,527 91
MISCELLANEOUS REPAIRS CHAMPLAIN CANAL.		
Raising and refitting four bridges between W. Troy and Cohoes	$915 00	$915 00
Rebuilding piers to Cohoes bridge	6,000 00	4,306 50
Building slope wall and docking at High creek, so. of Coveville,	1,209 55	1,209 55
Constructing vertical wall to protect south end of dam at head of Glens Falls feeder	1,925 00	1,926 00
Protecting highway below Coveville	200 00	200 00
Total	$10,249 55	$8,556 05
EXTRAORDINARY REPAIRS CHAMPLAIN CANAL. ACT, CHAPTER 311, LAWS OF 1863.		
Valves for lock at Fort Edward	$303 12	$303 12
IMPROVEMENT CHAMPLAIN CANAL. ACT, CHAP. 186, LAWS OF 1864.		
Valves for sluice around north guard lock, Cohoes	$84 41	$84 41
Taking down, moving back and relaying berm abutment and new superstructure to Fitzgerald bridge, so. of Mechanicsville,	1,065 00	1,065 00
Taking down Cotton's bridge north of Wilbur's basin	1,190 00	1,190 00

* Balance paid by contractor, as required by contract.

Character of work.	Estimated cost.	Amount paid.
Taking down, moving back, and relaying berm abutment and new superstructure to Smith's bridge, north of Wilbur's basin,	$1,265 00	$1,265 00
Taking down, moving back and relaying berme abutment and new superstructure to McCulloch's bridge, north of Wilbur's basin,	1,015 00	1,015 00
Taking down, moving back and relaying berme abutment and new superstructure to Coleman's bridge, no. of Glens Falls feeder,	555 00	555 00
Taking down, moving back and relaying berme abutment and new superstructure to Griffin's bridge, north of Smith's basin.....	1,123 00	1,123 00
Taking down, moving back and relaying berme abutment and new superstructure to Wood's bridge, south Whitehall	1,039 18	1,039 18
Taking down, moving back and relaying berme abutment and new superstructure to Mandeville bridge, south Whitehall	1,060 62	1,060 62
Enlarging canal twenty-two chains on berme side north of Bemis Heights	1,050 00	1,050 00
Improving canal at road bridge, Fort Edward.	626 32	626 32
do do Robertson's bridge, 2 miles so. Ft. Edward..	180 10	180 10
do three points bet. Fort Edward and Glens Falls feeder,	166 50	166 50
do canal at Woodchuck Point, 5 miles no. of Ft. Edward,	72 60	72 60
do do first bridge south of Fort Ann.....	178 40	178 40
do do south Fort Ann locks.....	53 40	53 40
do do between Hewitt's lock and Coveville	1,870 20	1,870 20
Raising docking to tow path between south guard lock and tow path bridge, Cohoes.	561 60	561 60
Completing section No. 1, stopping leaks Glens Falls feeder	22,530 00	11,194 61
Rebuilding road bridge at Glens Falls.....	3,875 00	3,000 00
do Haviland bridge on sec. 2 and work connected	3,435 00	3,435 00
Work with dredge between Hewitt lock and Mechanicsville.....	10,000 00	1,500 00
Lock cut above Moses kill lock	6,530 00	500 00
Raising embankment to road bridge south Bemis Heights.....	90 00	90 00
do do do at Wilbur's basin	150 00	150 00
Improvement Waterford side cut	11,500 00	.....
Total.....	$71,266 33	$33,025 94
MISCELLANEOUS REPAIRS BLACK RIVER CANAL.		
Rebuilding two bridge superstructures and seven farm bridge bents between Ridge Mills and North Western (difference)*..	$1,245 76	$690 50
Protecting tow path between locks Nos. 32 and 33.....	242 00	242 00
Bridge superstructure and bents at Back Hill road.....	479 39	479 39
Extra work repairing break on Black River feeder in 1861.....	1,794 30	1,794 30
Building stop gate on Black River feeder in 1864	443 20	443 20
Docking at Lee's do do 1865	127 00	127 00
Two bridge superstructures north of Boonville, 1861 (difference)*	415 56	172 50
One set bridge bents do do 1861 do *	118 60	74 00
Three bridge superstructures on canal and feeder, 1865 (dif.)* ..	947 58	438 69
One do do at lock 107, 1863 (difference)*.....	416 08	216 45
Inserting new valves in guard lock Black River feeder, 1864....	147 84	147 84
Loose stone at locks 98 to 101, 1861.....	395 00	395 00
Repairing Otter Creek dam, 1862.....	742 75	742 75
Building lock house at Otter Creek lock, 1862	400 00	400 00
Altering gearing to lock gates Otter Creek lock, 1862.....	21 00	21 00
Repairing and altering draw bridge at Beach's, 1861.....	24 50	24 50
do do do Carter's & Tiffany's, 1863,	123 39	123 30
do do do Beach's and Illingworth's, 1865	218 76	218 76
Planking Carthage bridge with hardwood, 1861 (difference)*....	354 76	157 76
Rebuilding superstructure to bridge across Black river at Carthage, wrought iron tubular arch truss, 1865 (difference)*.....	11,922 50	8,422 50
Rebuilding bridge over the outlet of North Branch reservoir....	222 36	222 36
Total	$20,802 24	$15,553 80
EXTRAORDINARY REPAIRS BLACK RIVER CANAL.		
Constructing pier at Otter creek, Black river.....	$6,500 00	.....
Grand total—Table No. 2.....	$163,115 47	$107,587 88
Table No. 1.....	306,602 74	123,355 94
Both Tables.....	$464,719 21	$230,943 82

* Balance paid by contractors, as required by contract.

GENERAL RECOMMENDATIONS.

Removing Benches.

Much benefit has arisen to the canals of this State by the removal of the small portion of the benches on the Eastern Division of the canals which have been lately removed, and much greater facilities for navigation would exist if all the remaining portions were removed. Upon the Erie canal the benches have been removed, except upon the Eastern Division, where the canal should be largest and afford the easiest possible passage for boats. At the eastern end of the Erie canal all the boats passing down the Erie, and from the lateral canals to tide-water, are gathered together and forced into the old and narrow channel where the benches still exist, and is one fifth less in capacity than where they are removed, and much difficulty has been experienced in the prevention of crowds and in the maintenance of unobstructed navigation.

About fifty miles of the benches still remain and should be removed at the earliest opportunity, and the Legislature should make an early appropriation for that purpose.

Supply of Water.

Much discussion has been had during the past few years concerning the supply of water for the Erie canal. Quite a number of sources have been suggested; but the most certain and constant source from which to draw a supply is Fish creek, by the construction of Fish Creek feeder, which I have recommended in former reports.

Fish creek feeder would afford a constant and ample supply, and though the work would be expensive, the certainty of the maintenance of navigation upon the Erie canal during the season of low water would fully warrant such an expenditure. The quantities of water furnished by the old sources of supply is constantly diminishing as the country from which they are drawn is cleared from timber and opened to the drying effects of the sun, and sooner or later the waters from the Fish creek must be brought in as a further supply, and there is no sufficient reason why it should not be done now as well as later.

These detentions have been frequent during almost every season for years past, and some remedy must be found, or the navigation of the canals abandoned, because of its inconstancy and uncertainty.

As a further source of supply, or rather as a means of saving

the water already brought into the canal, I desire to recommend to the Legislature the construction of a weigh lock at Frankfort, to partially supersede the lock at Utica. The last named lock is too small and imperfect in its construction to weigh the boats and cargoes which it is desirable to weigh upon it. It is frequently over-tasked, and is constantly failing in consequence, and all the water used by it is diverted and lost to the canal. The cost of making it equal to the demand upon it would be equal to the cost of a new lock, and when completed the objection of losing the water would still exist. The construction of a weigh lock at Frankfort would in no way hinder navigation, and the water used by it could be returned to the canal on the level below without loss, and the Utica lock could be used by the smaller boats from the west passing down the lateral canals, and for those boats which might unload at Utica. The amount of water saved, according to a former report upon the subject, would be 1,375 cubic feet per minute, and such a saving would fully warrant the construction of the new lock.

Concreting Lock Bottoms.

In the construction of the earlier locks upon the enlargement of the Erie canal, the locks were built upon a wooden floor, as at present, but the insterstices between the floor timbers was filled in with gravel instead of concrete, as is the practice at the present time. Of the locks constructed upon that plan sixteen now remain which have not been concreted. These locks are in constant danger of giving out, or of being ruined by the settling of the side walls, as the gravel between the floor timbers, and in many instances much deeper, has been washed out by the pressure of the water from the lock. They should be all concreted and refloored so as to make them secure beyond all question, and prevent any interruption to navigation by their failure. I would recommend that the present Legislature make an appropriation for the purpose.

Appropriations Necessary.

I earnestly recommend to the Legislature the passage of laws for the construction of the following works, and the appropriations of the sums set opposite for such works, as they are all important and necessary, and many of them highly so.

For removing the remaining benches on the Eastern *Division of the Erie* canal..... $1,000,000

For the construction of Fish Creek feeder	$350,000
For the construction of a weigh lock at Frankfort to supersede the Utica lock	40,000
For concreting lock bottoms built prior to the improved plan of enlargement	50,000
Rebuilding Moses kill and Fort Miller locks on the Champlain canal	75,000

All the works above mentioned are spoken of in other parts of this report at greater length, and should be authorized and provided for at the earliest practicable period.

Construction of a Ship Canal.

Questions have been asked and partially discussed, during the last few years, as to the future capacity of our canals for furnishing all the necessary facilities for transporting the produce of the Western States to the markets of the Atlantic; and also whether a still further enlargement of the Erie canal so as to give it the capacity and character of a ship canal, and enable shippers to send forward grain and produce in the same bottoms from Chicago and Milwaukie to the Atlantic, and thence to Europe, would not prove advantageous to the interests and business of the country; and, finally, if such an enlarged canal should be found impracticable for want of water, or from its great cost, whether a ship canal should not be constructed so as to admit the transit of sea-going vessels from Lake Erie to Lake Ontario through this State.

From the annual reports of the Auditor of the Canal Department, on the "tolls, trade and tonnage of the canals," it is clearly demonstrated that the capacity of the canals is by no means reached, while the quantity of tonnage of property seeking transit seems nearly at its greatest height. It is not meant by this that the prolific grain-producing west has reached its maximum, but that the quantity necessary to equalize the various markets of the world has been nearly attained. Great famines or vast and consuming wars in other counties would of course stimulate and increase production in the West, and might for a brief period exhaust the present capacity of the canal and throw large quantities of produce on to the railroads leading from the Atlantic cities to the inexhaustible grain-fields of the West; but public works are not constructed to provide against the uncertain and distant calamities of war and famine.

A ship canal occupying the place of the present canal should not in my opinion be undertaken without a thorough exploration

of its route, and a careful and scientific investigation as to the supply of water. The present canal runs through the heart of five flourishing cities and numerous villages which have mainly grown up since its first construction, and the damages of such an enlargement would be large unless new channels should be opened outside of the cities and villages.

It is impossible to foresee all the contingencies which may hereafter influence and finally determine the course of trade between the Atlantic and the West. Should Canada at some future, but not distant, time become incorporated into the United States, the St. Lawrence river would in that case be open to a free and unrestricted intercourse between Quebec and the West, and whether in that case a ship canal through New York would offer facilities of transportation which would secure to the city of New York its present advantages, is a matter well deserving our serious consideration. Such a canal must compete against a free river communication, having a circuitous course and to some degree dangerous navigation.

As it is not improbable that the people will call a constitutional convention within the next year or two, and as some alteration in the Constitution will be necessary before so great a work can be undertaken, it might not be impolitic for the present Legislature to authorize a commission to examine the whole subject, to estimate the cost and ascertain as nearly as practicable whether the necessary supply of water can be obtained, with a view that the convention may have before it reliable estimates for its action.

It might also be expedient for the Legislature to authorize the Executive to open communication with the executive governments of the principal western states, to ascertain how far they would be willing to co-operate with New York and share in the responsibility and expense of constructing a ship canal of adequate dimensions.

If those states should be willing to participate in the cost in proportion to the advantages they would derive from the construction of such a canal, then it would be possible for the convention to authorize this work by the issue of a canal stock equal to the whole cost of the work, and based solely on its revenues, or on the credit of the states united in the construction, and thus relieve the people of this State from all apprehension of being taxed for the enrichment and benefit of the Western States.

My apology for this brief and imperfect reference to a subject

which is daily becoming more and more pressed upon the public consideration, is that it will be necessarily brought before the convention likely to be called the coming year, and the importance of having authentic and well ascertained facts for the consideration of that body, as well as the disposition of the states at the west to participate in a work in which they are so deeply interested.

With the foregoing remarks upon what I deem important and necessary for the maintenance of the canals which have been under my direct charge during the past six years, and some vague suggestions as to the greater and more complete consummation of the public works of this State,

I subscribe myself, respectfully,

W. I. SKINNER,

Canal Commissioner in charge Eastern Division.

Dated 30th December, 1865.

MIDDLE DIVISION.

CANAL COMMISSIONER'S OFFICE,
SYRACUSE. *Oct.* 1, 1865.

The canal laws of the State require the Canal Commissioners to make an annual report to the Legislature, in which they shall "state the condition of the canals, all the works connected therewith and the improvements; the improvements and repairs made during the past year, or contemplated to be made, and the amount of money during the same period received and expended by them and each of them, in the discharge of their duties; and shall recommend such measures in relation to the canals as they shall deem the public interests require."

In obedience to this statute, the Commissioner in charge of the Middle Division has the honor to respectfully submit the following

REPORT.

The fiscal year just passed has been one of unusual character—disastrously affecting the canals, and possessed of natural causes and influences which present a record deserving of careful examination and study. The damage done to the canals by the unprecedented freshet in March, has been the cause of large expenditures, as will be shown hereafter; but added to this natural cause and effect, is a practice which has become annual in its effects and hardly less damaging, viz: the passage by the Legislature of multitudes of special laws affecting the canals, which draw large amounts of money from the treasury without a corresponding benefit resulting to the canals. These combined causes have produced an effect in the general expenditures of money by the disbursing officers, not calculated to flatter the hopes of the people, or prove conducive to economy or the future welfare of our public works. When the Legislature passes these special laws, which,

in the large majority of cases, are for the benefit of localities and contractors, and appropriates thousands or tens of thousands of dollars therefor, the canal authorities are bound to obey the requirements of the law, and make the expenditures demanded. When, in return, their several reports are submitted to the Legislature, exhibiting the expenses and outlays upon the several divisions, they are not unfrequently censured for making large expenditures, made by *direction* and *requirement* of the Legislature, and which would have been saved to the State had no special law been passed unlocking the treasury and *requiring* the Commissioner to abstract the funds appropriated by it, after which he, and not the Legislature, is held responsible.

The Commissioner does not wish to be understood as saying that the Legislature should pass no special acts for the relief of contractors who may have just and proper claims, or for specific objects and purposes for the benefit of the canals; but he most earnestly protests against the frequent practice and easy manner by which delinquent contractors are released from contract obligations, and are sometimes awarded sums more justly due from them to the State. Special laws benefiting localities, constantly encourage other localities to apply for like privileges; and with precedents to cite, seem to find little or no difficulty in the way of securing the object sought. A large percentage of the expenditures upon the canals are the direct result of this practice; but the Commissioners trust to the wisdom of the present Legislature to commence the work of retrenchment in this particular, and thus in some degree relieve the burthen of expenditures for the canals, and at the same time relieve the Commissioners from the odium of extravagance.

The total expenditures upon the Middle Division during the fiscal year, ending the 30th Sept., 1865, was	$684,547 65
Of which amount there was paid for repair of damages caused by the freshet in March	276,552 42
Actual expenses after deducting amount paid for repairs of damages caused by the freshet	$407,995 23
Total expenditures in 1864	$498,201 24
Total expenditures in 1865, after deducting expenses of freshet	407,995 23
Decrease in 1865	$90,206 01

In order to arrive correctly at the amount expended for *ordinary repairs*, the following sums, disbursed under special acts of the Legislature, should be deducted from the above amount of		$407,995 23
For weigh-lock at Oswego, under act, chap. 298, Laws of 1864	$21,233 00	
For stone dam at Phœnix, under act, chap. 395, Laws of 1865	17,333 00	
For berm-bank in Oswego river, under act, chap. 395, Laws of 1865	15,045 00	
For award to Martin Holmes, for work done in 1855, under act, chap. 261, Laws of 1865	14,382 00	
For work in Chemung river at Corning, under act, chap. 298, Laws of 1864	9,775 00	
For Snyder's patent draw bridge on Cross street, Elmira, act, chap. 473, Laws of 1864	1,900 00	
For bridge on Huy's farm, on Chemung feeder, act, chap. 356, Laws of 1863	1,350 23	
For iron bridge on Washington avenue, Elmira, act, chap. 167, Laws of 1863	2,729 00	
For swing bridge on Second street, Elmira, act, chap. , Laws of	2,723 05	
For farm bridge on Chemung feeder, at Gibson's, act, chap. 168, Laws of 1865	400 20	
		96,870 48
Leaving the sum of		$311,124 75
Which amount is the actual cost of ordinary repairs (aside from the expenses of the freshet), being less than in 1864 by		$187,076 49
Drafts have been drawn on the Comptroller and paid from the General Fund, for the work in the Chemung river, at Corning, under act, chap. 326, Laws of 1865, to the amount of		23,659 00
The whole amount paid on account of the extension of the Chenango canal, is.		15,619 03

A detailed statement of all expenditures is exhibited in the appendix to this report, in connection with brief descriptions of the several repair sections and canals.

Canal Expense Accounts.

The expenses of the canals are now charged under two heads of expenditures, viz.: "Ordinary" and "Extraordinary Repairs." By the terms of the present repair contracts *all* of the "ordinary repairs" are to be performed by the repair contractors, except in case of breaks and breaches, when the expense of repairing such breaks or breaches exceeds the sum of five thousand dollars, at that point the liability of the contractor ends and the State assumes *all* of the remaining expense, be the same more or less. Under the former class of repair contracts, many of which are still in force, the liability of the contractor extended to four thousand dollars, beyond which amount the State assumed and paid one-half of the cost of repairs. This change in the conditions of the contracts was made at the instance of the Auditor of the Canal Department. Before any moneys can be drawn from the fund for extraordinary repairs, there are three statute requirements to be complied with, viz: (1) The certificate of the division engineer in charge that the repair contemplated is necessary to be made, and which is accompanied by a detailed estimate of the cost; (2) the approval of the

Board of Canal Commissioners of such proposed repairs; and (3) the affirmative votes of at least five members of the Canal Board.

The extraordinary repair account seems to have been substituted for the enlargement account, which was closed up by act chap. 167, Laws of 1862, which took effect on the first day of September of that year. By the terms of this statute, the enlargement of the Erie, Oswego, and Cayuga and Seneca canals was declared fully completed, the account closed up, and all contracts then in force, made in good faith under the enlargement law were, at once annulled, leaving, in many instances, sections of the canal in an unfinished and incomplete, not to say, perilous condition, and some of which are still unfinished. In some instances the re-letting of work was indispensable, which was done at prices largely in excess of the former contract prices, thus needlessly involving the necessity of expenditure of a very large sum of money which benefitted no one but those who were fortunate enough to receive the contracts at the advanced prices. As a case in point illustrating the operations of the law, the Commissioner refers to the construction of the De Ruyter reservoir, which was in process of completion at the time the act took effect. This work was stopped; the contract closed, and the final account made and paid. It was again let by the late Commissioner at advanced prices, in consequence of the former contractor having done nearly all of the profitable work and neglected such as he could illy afford to do at his prices, and which advance in this single case amounted in the aggregate to more than $38,000. What benefits have ever resulted to the State from the passage of the law in question, the Commissioner is not advised.

The Freshet in March.

Early in March, and just as preparations were being made for the commencement of "spring repairs," an immense freshet swept over the country, and left the most unmistakable traces of its fury upon the canals. At its very commencement, prompt measures were taken to prevent serious damage, but as the flood increased it became apparent that much damage would follow. The discharge ways were insufficient to make any very perceptible change in the volume of water rushing through the canals and their banks. The Chemung river rose to an unprecedented height, and swept over and through all the barriers that had been erected to protect the public works. The Chenango river poured its waters over and

through the Southern section of the Chenango canal, demolishing many of its structures, sweeping away about three miles of its banks, and inundating and seriously damaging the whole. As shown under the proper head, the Oswego river was never so high, and certainly the damage done by it was never so great. Small leakages and large breaks were being almost constantly reported to the Commissioner while the telegraph lines remained unbroken, but when this means of communication was cut, the still increasing flood excited the most serious apprehensions. As soon as the waters in some degree subsided, engineers were dispatched to ascertain and report the damage done. Immense quantities of material were found in the prism wherever the banks had been forced by the pressure from without, and in most cases where the banks had been carried out by the force from within, the prism had also gone in depths varying from six to twenty feet. The Erie canal escaped in a marvellous degree, attributable to the fact that it had no overflowing rivers to contend with. The increased protection to the banks at Montezuma, put in in the summer of 1864, saved them from serious damage, though the water rose to a height of *four feet on the trunk* of the Seneca river aqueduct.

The detailed effects of the freshet, and the consequent expenditures, will be found on following pages and in the appendix, classified under the headings of the several canals.

ONEIDA LAKE CANAL.

The Commissioner regrets the necessity of again calling the attention of the Legislature to this work. He earnestly reiterates the recommendation made in his last annual report. The act chap. 486, Laws of 1862, should either be made operative by amendment and the appropriation of the sum requisite, else *wholly repealed*, so that the locks can be rebuilt as an "ordinary repair" with moneys appropriated for that purpose.

To the condition of this canal the Commissioner invites the special attention of the Legislature. The canal was purchased by the State, of the Oneida Lake Canal Company, in pursuance of an act passed May 11, 1840, (see Session Laws of 1840, chapter 258) for the sum of fifty thousand dollars. From that time on to the spring of 1863, the canal was kept in repair and used by the State. In *the winter and spring of* that year the Canal Commissioners adver-

tised and let the work of rebuilding the locks, in pursuance of chapter 46, Laws of 1860, and chapter 486, Laws of 1862. The contractors entered upon and commenced the work, tearing up the old locks (which are entirely destroyed) and bringing on material for rebuilding. Estimates for labor and material were made by the Engineer for which the then Commissioner made draft on the Auditor of the Canal Department, amounting in the aggregate to $3,315, on which the Auditor refused payment, owing to a defect in the laws under which the contract had been made. Since the spring of 1863 the canal has been wholly useless, and is now in that disabled condition. An effort was made at the session of the Legislature in 1864, to amend the act, but failed. Since the purchase of this canal by the State large amounts have been invested by individuals in manufacturing and other interests, dependent for success, to a great extent, upon the transportation of products upon this canal. The Commissioner respectfully suggests that the obligation of the State, under its Constitution "not to sell, lease or *otherwise dispose* of any of the canals," applies to this canal as fully and completely as to any other; if so, then the duty of the State in reference to this work is clear and unquestionable, no matter whether the canal is a "paying one" or not; no matter whether its location is the best which could have been made or not. The mandate of the Constitution is paramount to all minor considerations. For such reasons the Commissioner earnestly recommends that your honorable body make such an appropriation for this purpose as will put this canal in navigable condition.

CHENANGO CANAL.

For a detailed statement of the condition of this canal, its reservoirs and feeders, together with the cost of repairs and improvements, reference is made to the Appendix.

In this connection the Commissioner calls the attention of the Legislature to the present and constantly increasing necessity of providing for the enlargement of locks Nos. 1, 2 and 3 in the city of Utica. A very large amount of shipments are made from the manufacturing establishments in the city, which necessitate a land transportation in order to reach the large boats navigating the Erie canal which cannot pass the present locks.

EXTENSION OF THE CHENANGO CANAL.

The Commissioner most earnestly recommends the speedy completion of the extension of the Chenango canal. In his judgment it will prove of invaluable interest to the southern and central portions of the State.

Had the work been commenced as contemplated by act, chapter 185, Laws of 1864, one-half of it would have been by this time nearly or quite completed. As soon as the conditions embraced in said act had been complied with on the part of the owners of the North Branch canal in Pennsylvania (with which the extension is to connect), the undersigned immediately directed the following communication to the Comptroller:

CANAL COMMISSIONER'S OFFICE,
SYRACUSE, *June* 25, 1864.

Hon. L. ROBINSON, *Comptroller*, Albany:

Dear Sir—The preliminary requirements of the act, chaps. 115 and 185, Laws of 1863 and 1864, providing for the extension of the Chenango canal, having been complied with so far as to commence surveys for said extension, I address you to enquire whether you have made provision for funds requisite to pay the expense of the survey and construction as provided by said law. It is important to get the survey completed and the work under contract at an early day as practicable this season, in order that it may be prosecuted the coming fall and winter.

Please inform me how soon (if not already done) you will provide funds for the purpose?

I am, sir, very respectfully yours,
B. F. BRUCE, *Canal Commissioner.*

The following is a copy of his reply:

COMPTROLLER'S OFFICE,
ALBANY, *June* 27, 1864.

Hon. B. F. BRUCE, *Canal Commissioner:*

Dear Sir—In reply to your favor of 25th inst., I have to say, that after a careful examination of the question, I find that I cannot borrow money as directed in the act for the extension of the Chenango canal, without a clear and palpable violation of the Constitution; and this opinion is not mine alone. In 1860 an act was passed to provide means for the completion of the canals,

which contained a section directing the Comptroller to make a temporary loan in precisely the same language as that employed in the Chenango act. I am informed by the Auditor, that the Commissioners of the Canal Fund, upon a full consideration of the question, were unanimously of the opinion that the Comptroller had no power to make any such loan, and he did not attempt to make it. Having no doubt whatever of the soundness of this opinion, my action will be in accordance with it. Consequently no funds can be provided for the extension of the Chenango canal until the tax for that purpose shall be collected and paid into the treasury. About one-half of such tax may be received by the 1st of May, 1865, and the other half probably about November or December, 1865.

Very respectfully, your obedient servant,

L. ROBINSON, *Comptroller.*

The Comptroller thus having refused to advance or provide any funds to defray the expense of a survey and the other preliminary expenses preparatory to letting a portion of the work, the Commissioner next solicited a loan from the Sinking Fund of six thousand dollars, the Commissioners of the Canal Fund in 1859 and 1862 having established a precedent by loaning nearly twelve hundred thousand dollars from that fund to the canal enlargement. This proposition was rejected by the Comptroller, and finally, on the 23d day of September, 1864, the following preamble and resolution were adopted by the Canal Board, to wit:

Whereas, the Legislature at its last session passed an act to authorize the extension of the Chenango canal to intersect the North Branch canal, in Pennsylvania, thereby forming a complete water communication to the immense coal fields of Pennsylvania, which, when completed, it is believed will have the effect to materially reduce the price of coal, thereby saving to the people of this State a large annual expenditure; and

Whereas, all the requisitions of said act having been complied with, except the mandatory provision that the Comptroller "is hereby authorized and required to make a temporary loan in anticipation of the collection of the tax ordered to be levied and collected by the first section of this act;" and

Whereas, the Comptroller declares such provisions cannot be executed "without a clear and palpable violation of the Constitution." and therefore refuses to make or effect such loan; and

Whereas, it is important that the survey for said extension be made immediately, as directed by the Board of Canal Commis-

sioners at a meeting held July 8, 1864, and for which purpose no funds have been provided by the Comptroller; and

Whereas, there is a fund set apart by the Legislature denominated "Extraordinary Repair Fund," for the use and benefit of the canals of the State, which said fund is much more than will be required for immediate use; and

Whereas, if a portion of said fund be set apart to defray the expense of making the necessary survey for said extension, it could be returned to said Extraordinary Repair Fund from the proceeds of the tax required to be collected by the act aforesaid, before it would be wanted for canal purposes; and

Whereas, no debt would thus be incurred (as the State cannot be in debt to itself); therefore,

Resolved, That the sum of six thousand dollars ($6,000), or so much thereof as may be necessary, be set apart from the Extraordinary Repair Fund to defray the expenses of a survey and maps for the said extension of the Chenango canal, and that the Auditor of the Canal Department pay the Canal Commissioner's drafts for such purpose to an amount not exceeding such sums, and that he reimburse the amount so paid from the proceeds of the tax authorized by act, chap. 185, Laws of 1864.

Subsequently to this action by the Canal Board, the Commissioners of the Canal Fund did loan to the Extension Fund the sum of $6,000, which has been reimbursed, and the foregoing preamble and resolution, under which no money was drawn, has been rescinded by the unanimous vote of the Canal Board.

The appropriations under act, chaps. 115 and 185, Laws of 1863 and 1864, under which the extension is being prosecuted, will expire in April next.

The necessity of re-enacting the law is apparent.

In relation to the constitutionality of the acts above cited, the Commissioner submits the following remarks, as the question of its constitutionality will be likely to arise with the re-enacting of the law:

The act makes an appropriation of the sum of $550,000, or so much thereof as may be necessary for the purpose of extending the Chenango canal, and imposes a certain tax in each of the fiscal years of 1864 and 1865, upon the taxable property of the State to meet and defray such appropriation. As there is no natural or necessary obstacle, either in the terms of the enactment or in the nature of things, to this money thus raised and appropriated, being expended and drawn from the treasury within two years next after the passage of the act, such act is in no respect in conflict with sec. 8 of art. 7 of the Constitution.

It may be that if it should so happen that the money thus appropriated should not be expended and drawn from the treasury before the expiration of the two years, it could not be paid out afterwards without new and additional legislation. But this consideration does not in any respect affect the validity or constitutionality of the enactment.

The only question which can possibly be suggested against the constitutionality of the act is in regard to the power conferred by the fourth section upon the Comptroller, authorizing and requiring him to make a temporary loan in anticipation of the collection of the tax to be levied and collected.

The objection, if any is raised, must be that the law authorizing the borrowing of the amount of the tax, in anticipation of its collection, has not been submitted to the people, at a general election, and received a majority in its favor of all the votes cast for and against it, according to the provisions of sec. 12 of art. 7 of the Constitution. This question would only suggest itself to a mind unfriendly to the success of the improvement provided for by the act, or to one so hampered by technicalities and notions of strict construction as to be incapable of discovering the plain and common sense meaning of any act of the Legislature appropriating public money to schemes of improvement.

This affected superiority of discernment has frequently passed in our State for far more than it was really worth, and indeed has but too frequently proved, upon repeated trial, to be but a poor counterfeit of the genuine article.

No submission to the people is required, or would be proper, unless the statute provides for the creation of a debt againt the State. This statute does not contemplate contracting a debt against the State, either by its terms or by necessary implication. A debt contracted against the State necessarily implies that the public credit has been used in the contract, or directly pledged in some way to its payment. It creates an obligation against the State to pay it, either absolutely or contingently. This the act in question manifestly neither authorizes in terms or contemplates. No provision is expressed or implied to use the credit of the State in making the loan, or to give any bond or other obligation creating any liability against the State. If the Comptroller should undertake to pledge the credit of the State, as upon a simple transaction of borrowing money on its account generally, and give its bond or other obligation for its payment, the transaction would

unquestionably be illegal and void, for the reason simply that no such transaction was either authorized in terms or intended by the act. No officer intending honestly and fairly to execute the power conferred by the fourth section would think, for a moment, of effecting the loan provided for in that way. It would only be done thus through design to defeat and avoid the purpose of the legislative will, as expressed in the law. What it *does* authorize and require plainly is that the loan should be made simply upon the credit of the *tax to be raised*, and nothing else. "In anticipation of the collection of the tax," is the language used; not upon the credit of the State, or of the people of the State generally, but merely upon the credit of a certain and definite sum of money, which the State has provided for the raising of by the legitimate and constitutional method of taxation. This fund, thus provided for by law, might unquestionably be assigned by the Comptroller in advance, under the authority conferred by the fourth section, to secure the payment of the money advanced, on the faith of the tax, without any recourse on the part of the lender to the State; or the fund to be thus raised might be pledged in the same way, without further security or recourse. This clearly would create no debt against the State in any sense. It would not be contracting a debt in any sense within the meaning and intent of the Constitution. It would no more constitute a debt than would the advance of money upon the assignment of a bond and mortgage, or other *chose* in action, without any guaranty or other personal obligation for the payment of the money thus advanced.

This pledge or assignment of the fund, to induce and secure the advancement of the money, is clearly within the power of the Comptroller under the act. The authority conferred, to anticipate the collection of the tax by a loan, necessarily carries with it and implies all the incidental powers necessary to complete the transaction contemplated *in a lawful manner*, not an unlawful one. Hence he would have the authority to assign and pledge the fund without any other recourse to the one advancing the money, because that would be a lawful and constitutional transaction, while at the same time he would not have the authority to make the loan on the credit of the State, and give the bond or other obligation of the State to secure the re-payment, because that would be illegal and unconstitutional, and would not fall within the terms or meaning of the statute.

That the intention of the law-makers was that the Comptroller

should procure the advance of the money upon the basis of the tax fund alone is perfectly apparent. It is not to be presumed that the Legislature intended to violate the Constitution in the passage of the act. The presumption, on the contrary, is that the members of the Legislature understood the Constitution, and intended to enact a law in harmony with its provisions, and that it is in harmony with such provisions until the contrary is shown. This is a well settled rule of construction, which has always prevailed in courts and all other bodies, and with intelligent persons, except the class of persons before referred to. Another rule is that a statute should always receive the interpretation which would render it valid and effectual, if reasonably susceptible of it, rather than that which would render it invalid and nugatory, if it admits of two constructions, which the act in question does not. The power conferred and required to be exercised can be exercised without violating any rule of law, or any constitutional prohibition or limitation upon legislative powers, and therefore the act is not unconstitutional in any of its provisions, but is, on the contrary, perfectly constitutional and valid throughout.

CAPACITY OF DOUBLE LOCKS ON THE ERIE CANAL.

Much speculation has been had as to the time when a greater capacity will be required for the transmission of the eastward bound freight upon this canal.

The following statement has been prepared at my request by the Engineer Department, and exhibits the increase of tonnage for the next twenty years, as compared with the corresponding number of years last past, and indicates the time when the limit of capacity will be theoretically reached.

STATEMENT.

It has been estimated that the time required to pass a boat of the large class drawing 6 feet of water is $7\frac{1}{2}$ minutes, or 8 to the hour when the lockages are equal in both directions. As this can seldom be the case for any great length of time, and in view of the difficulties often encountered in getting some of the large boats into the locks, it is believed that an average of 10 minutes will be consumed in passing each boat, giving 288 lockages per day at the double locks.

The average capacity of the large boats now in use is taken at 200 tons; and the proportion of the eastward to westward bound freight as 8 to 1.

Assuming that the average number of days of navigation per season is 200, we have

144 lockages of 200 tons	28,800
144 " 25 "	3,600
Tonnage per day	32,400
Per season of 200 days	6,480,000

The tons of total movement on the Erie and on all the canals in the years following was

	Erie canal.	All the canals.
In 1844	635,345	1,816,586
1864	2,146,634	4,852,941

The average ratio of compound yearly increase for the above period of 20 years, is for the Erie $6\frac{28}{100}$, and for all the canals 5 per cent.

The future trade of the canals is somewhat a matter of conjecture, but it perhaps is not unreasonable to suppose that the ratio of increase in the next 20 years will equal that of the past. Upon this assumption the following table, calculated from the tonnage of 1844 and '64 as a basis, exhibits the estimated trade on the Erie, and on all the canals for the years 1880, '82 and '84.

Estimated Tons of total movement.

Years.	Erie canal.	All the canals.
1880	5,688,000	10,600,000
1882	6,425,000	11,680,000
1884	7,257,000	12,876,000

THE REPAIR CONTRACT SYSTEM.

In each of his former reports the Commissioner has so fully expressed his opinion of the practical workings and operations of this system, that he refrains from any extended discussion of the subject at this time, further than to say that he can see no reason for changing, or in the least modifying, the opinions before expressed, that the whole system is wrong in theory, bad in practice, and will ultimately prove a worse one for the interests of the State and the welfare of its canals than any of its predecessors.

REMARKS.

In concluding this Report, the Commissioner begs leave to suggest to the Legislature that it is the duty of Canal Commissioners

to carefully prepare an estimate each year of the cost of canal repairs, which is submitted to the appropriate committee of your honorable body. These estimates are designed to include only such expenditures as are apparent when the estimate is made. When the annual appropriations *are made* to cover *such* estimate and *no* more, it is frequently the case that the Legislature passes an act for the construction of a bridge, a culvert, or some other structure or improvement, or relief of some person or persons with the closing requisition "the expense or cost of such construction or award to be paid from any moneys appropriated for ordinary repairs." It is apparent that such demands not being contemplated or provided for in the appropriation, reduces the fund and necessitates the passage from year to year of "deficiency bills" which would be obviated if each special law had a distinct and separate appropriation.

The following pages exhibit the repairs and improvements made during the year, and the present condition of the canals of the middle division, together with some suggestions and recommendations to which the attention of the Legislature is respectfully invited. The statements have been mainly prepared by the engineers, and will be found both correct and comprehensive.

All of which is respectfully submitted.

B. F. BRUCE,
Canal Commissioner.

DETAILED STATEMENT OF THE REPAIRS AND IMPROVEMENTS MADE DURING THE YEAR, AND IMPROVEMENTS NECESSARY TO BE MADE ON THE CANALS OF THE MIDDLE DIVISION, ACCOMPANYING THE COMMISSIONER'S REPORT FOR THE FISCAL YEAR ENDING SEPTEMBER 30, 1865.

Repairs of Erie Canal.

No interruption to navigation has occurred upon the middle division of the Erie canal during the year just past. The necessary amount of water has been almost uninterruptedly maintained, though fears have been entertained that the Jordan level might suffer somewhat before the close of navigation for want of the necessary supply in the Skaneateles lake reservoir to furnish the requisite amount of water. The Jordan and Port Byron levels (distance 25 miles) are supplied almost wholly from Skaneateles lake; the other feeders, viz: Camillus, Carpenter brook and Weedsport are natural streams taken into the canal, which, in time of the most need, are of but little value. The only available source from which a further supply of water can be obtained is from the Owasco creek at Port Byron; and it is urgently recommended that a sufficient amount of that stream be appropriated to supply the Port Byron level, which will materially relieve the Jordan level, in which case there can be no doubt of a full supply for all the wants of navigation.

The following is an estimate of the cost of constructing an open feeder twelve feet wide on bottom, with side slopes $1\frac{1}{4}$ to 1:

Quantities.	Items.	Prices.	Amounts.
	Bailing and draining	$500 00	$500 00
8,000	cub. yards excavation	40	3,200 00
12,000	" embankment	35	4,200 00
1,000	" lining	50	500 00
2,100	" puddling	15	315 00
120	" procuring and puddling gravel	60	72 00
180	" quarry stone pavement grouted	4 00	720 00
100	" loose stone	2 00	200 00
400	" loose stone and brush	2 00	800 00
250	" masonry in abutments and wings	12 00	3,000 00
40	" masonry in arches	16 00	640 00
20	" masonry in coping	18 00	360 00
1,000	F. b. m. white oak	50 00	50 00
9,000	" white pine	50 00	450 00
19,000	" hemlock	20 00	380 00
1,000	pounds wrought iron	14	140 00
200	" cast iron	07	14 00
1,000	" spikes and nails	10	100 00
200	square yards painting	30	60 00
	Total		$15,701 00

The foregoing estimate does not include the land damage or damage to water power which would be caused by the appropriation of the stream.

The map herewith submitted, shows the line of the proposed feeder, and the property interested or affected by the proposed appropriation.

The structures upon the Erie canal and its feeders are mostly in good repair; new gates were inserted in some of the locks last spring, and a few others will be required before the opening of next season.

New bridges have been substituted at Burdick's Landing, West and Geddes streets, in Syracuse, also at Gere's Landing and Montezuma.

The banks of the canal in several places have shown signs of weakness, and have been repaired and strengthened. The heavy banks across the Cayuga marshes are constantly settling, and will require further protection in many places, in order to secure them against the possible contingency of breaks. It is recommended that an appropriation of $20,000 be made for raising and otherwise strengthening these banks, as a breach at almost any point upon the marshes would prove most disastrous to navigation, and involve a large expenditure for repairs in consequence of the distance from the canal of suitable materials to form such banks.

The culvert at Cowassalon creek has been a source of much trouble again this season, and the recommendation contained in the report of last year in regard to this matter, is again urged as the only apparent remedy of the existing evil.

Two new stop-gates have been constructed on the long level, viz: at Durhamville and State Bridge.

The location of weir to discharge the surplus water from the Syracuse level, has been changed from the old railroad basin to a point just east of the West Street bridge, leaving a channel 110 feet wide, which is a great improvement for those navigating the canals.

The vertical wall at the east end of the Syracuse weigh-lock, which had become a source of great annoyance to boatmen, has been taken up and relaid back from the line of the face of the lock one foot, since which there has been no trouble or delay at that point.

New gates have been put into locks 47, 48 and 49, also in the weigh-lock, and timber procured for others, to be used as necessity

may require. The towing-path is in much better condition than a year ago, having been quite extensively graveled the past season.

Much damage was caused by the flood of March last, the repair of which, however, was mostly covered by the repair contracts.

At Cazenovia the lower dam was carried away, and with it the bulkhead belonging to the State; this and the bridge above the dam across the feeder, which was also destroyed by the same flood, have been rebuilt in a substantial manner.

The reservoirs which supply the Erie canal are in good condition; some repairs will be required to the stop-gates and racks at Erieville reservoir.

The culvert below lock No. 50 was badly damaged by being undermined at the lower end during the freshet of last spring. This has been repaired by filling the space washed out with stone, and extending the wing walls about fifty feet.

The Oneida Creek feeder will be bottomed out before the opening of navigation next spring, and the whole work so improved that a much larger amount of water will be secured for the canal than has been possible heretofore.

So much trouble has been experienced for years past to dispose of the surplus water upon the Syracuse level in the time of extreme storms, and when the locks are actively employed, it is urgently recommended that further facilities be provided for discharging the same, as without it weighing of boats at the weigh-lock has to be suspended at times in order to keep the level within the bounds of safety.

OSWEGO CANAL.

This canal suffered greater damage in consequence of the freshet of March last, than any other upon the middle division. Upon section No. 1, that portion passing along the northern borders of Onondaga lake for a distance of five miles, the towing-path was for much of the distance seriously damaged, and the protection wall on the lake side of the bank had to be relaid throughout nearly its entire length. From Mud lock to Three River Point, the channel is in the Seneca river. The towing-path was inundated for some time, and as the result, the lining upon its surface was for the most part washed away, and required replacing. The sluices and bridges in the towing-path were mostly rendered useless, all of which have been repaired or rebuilt.

The repairs of the damage caused by the freshet upon section No. 2, were made by the superintendent of repairs (the contractor, Chas. E. Case, having abandoned his contract after the extent of damage became known). The condition of the section and the difficulties encountered in the repairs, are fully set forth in the annexed report of assistant engineer M. S. Kimball, who was employed on the work, and who rendered services in making the repairs, which entitle him to much greater compensation than the Commissioner was authorized to allow.

Letter from Assistant Engineer Kimball.

FULTON, *September* 1, 1865.

Hon. B. F. BRUCE, *Canal Commissioner:*

Dear sir—Under your direction I now proceed to give you a history of the damage done to the Oswego canal by the high water of last spring.

First. *Big Mill.* This was an immense mill covering four-tenths of an acre of ground, with two hundred feet fronting on the canal. The foundation wall faced up to the canal, and was in effect so much of the canal bank, and at the same time, together with the bank extending below to the lock, and the dam proper across the river formed the pond. This mill was burned several years ago, still no fears were entertained for the permanency of the walls, and their ability to sustain the high water. They doubtless would have sustained any ordinary high water, but the flood of last spring proved too much, and the walls were suddenly overturned on the afternoon of March 16th, and before any thing could be done to secure them the whole was swept out, and, as has since been ascertained, to the depth of twenty-five feet below low water. The water, in coming down the canal and turning at right angles, formed an eddy which abraded the high hardpan hill on the opposite side, cutting it back for a long distance, in places forty feet high, which, when added to the depth under water, left a perpendicular bank of more than sixty feet. There was a sublimity in its operation. The hardpan was underlaid with quicksand, which first became washed out, when masses came tumbling down, and for a short time would almost give hopes of closing the breach. All was soon swept away again and again, however.

The abutment of the river bridge was carried out, and with difficulty the superstructure saved. The water was shut off by sinking cribs and filling with stone. A heavy coffer dam was put in

across the breach to restore navigation, and the whole has been since banked in with stone in rear, and gravel lining in front, apparently secure as against a repetition of the same from a similar flood.

The work of closing this breach was put in charge of Thomas Gale, Esq., who, by his untiring and unceasing energy, accomplished it successfully, and without the slightest accident.

Second. *High Dam.* The new lock here was built landward, and about thirty feet away from the old one. A connecting wall eight feet wide was put in between them and across the floor of the old lock, the old lock being left in. Pier work, filled with stone, extended from the rear of the old lock probably twenty or thirty feet farther, forming the abutment of the dam. On the 17th, the day after the break at the Big mill, the High dam was visited by Superintendent Hart and myself, when the water was found running over the top of the lock and lock embankment, and works between the lock and dam. This was shortly turned off, and two men employed to watch it, and keep the water from again passing over. That they were faithful to their trust is positively known, as for several days after the break this bank remained, showing that no additional damage had been done to it, consequently no more water had been allowed to pass over. The two men lived with their families in the lock house, on the walls of the old lock, but which was finally, as the breach widened, swept away.

The first symptoms of disaster here is described by these watchmen as occurring early on the morning of the 20th, when a singular rumbling was heard in rear of the lock house. In a few minutes the stone in the abutment commenced whirling around, and shortly sunk down, and the whole thing went out a mass of ruins. At first the outside wall of the old lock remained standing, but becoming undermined, it in a few days went over. The floor remained, and the cross wall upon it stood and saved the new lock.

The breach was now 170 feet broad, though subsequently forty feet of the dam, undermined, had to be cut away. With this breach the lock embankment was nearly all carried away, and 750 feet of the berme bank on the level below. The berme bank was repaired temporarily, at first by putting in a coffer dam, restoring the navigation to this level. As to the dam, navigation was re-

stored, and the first loaded boat passed on the 7th of June, since which time nothing has occurred here to interrupt it.

Twenty-seven years ago a breach occurred in this dam of ninety feet. It is said that six weeks were spent in dumping in large quarried stone, with a view to gradually closing across. At the end of that time not a single stone had remained. All had been washed down twenty or thirty rods below. The line of conduct to be pursued now clearly pointed to the absolute necessity of some course likely to avoid being "stranded on such rocks." Preparation had been commenced by constructing roads, building shanties, contracting materials, &c. Some delay was experienced in procuring timber, as most of the mills on the river were embargoed by the high water. Timber had to be procured from the interior, where most of the mills were on small streams, and with small stock laid in. Meanwhile, however, the water was subsiding, and suitable men secured to manage the details of the work. F. D. Van Wagoner, who assisted in repairing the former break, and who had successfully repaired breaks in the Horse Shoe and Fulton dams, was procured to take the main charge, and with him were associated H. G. Beach, and again Thomas Gale, George Briggs, Isaac Thorp, William Patrick and others, all of whom rendered most faithful and efficient service. The plan adopted was to break up the water by dumping solid cribs of timber and stone. The cribs were generally thirty feet long, and varying from sixteen to twenty feet square. They were made with solid sides and ends, ten to twelve inches thick, put together with iron pins; also clamped with iron throughout and stapled across the corners, besides the wooden ties and braces inside. Around some there were wrapped from four to eight heavy cable chains. The height of some of these cribs from the top to the bed of the river was sixty feet. The concussion in falling was very great, throwing the water many times entirely across the break.

Aside from dumping these large cribs which served to divide and break up the stream, others were let down with lines into the smaller spaces, and then filled with stone. The last work was that of floating in trees and large rafts of brush, and loading and sinking them down with stone and gravel.

When navigation was fully restored, and the works made safe beyond any probable contingency, the work was put under contract, at a public letting, to Thomas Gale, and who is now prosecuting it, and has it nearly completed.

During the progress of the work, and when the breach was narrowed to forty-six feet, the question was asked how the whole Oswego river could run through so narrow a space. An estimate was made, showing that it must run twenty-four feet deep. Upon shutting it off the actual measurement showed it to be twenty-three feet.

The High dam, when done, will be in a state of perfect repair, but with the mass of material buried up there in that depth of water, and the little reliable covering that can be placed over it, and know that it is properly and securely placed, I feel as though I hazard nothing as against my reputation when I say that it is not, nor never can be, such a structure as the navigation of so important a canal as the Oswego should be made to rely upon very long—no longer, in my judgment, than it will take to build a new stone one somewhere on a rock foundation. This rock foundation is close at hand, both above and below.

Third. *Van Buren Dam.* A breach of about forty feet came between the foot of guard lock 5 and Van Buren's mill. The water was checked sufficient to mend it by dumping the canal full of stone off a bridge below, then repairing the break, and lastly removing the stone. This water ran down the canal over a mile, and broke out into the river, carrying away over one hundred feet of high bank. It was found also that there was a breach in the main dam, but being on an arm of the river, and on the opposite side, no inconvenience was felt from it till low water, when it was shut off with cribs of stone, where they now remain preparatory to rebuilding the whole dam with stone. It must be done; the dam is literally worn out. This breach proved to be about seventy feet long.

Oswego Falls Dam.—This, too, has a breach of seventy feet, and on the opposite side of the river. It has been shut off with cribs and there remains.

Horse Shoe Dam.—This dam was found greatly shattered, and much of the apron gone. It has been pretty thoroughly overhauled, though somewhat with reference to its being abandoned when the berm bank now in progress above is completed.

There was a breach in the berm bank in the village of Fulton, and another opposite out of the mill race, which much more exposed the canal; a breakwater was put in above, and the whole secured in a short time.

All along the canal, more or less everywhere, it was damaged

by the excessive high water. No such water has ever before been known. In rebuilding the locks of this canal, as well as the enlargement of the section work, great pains were taken to find the "high water mark," and arrange the new work accordingly. But this high water shows that the "oldest inhabitant" was not found, as new works that were supposed to be secure have found themselves "baptized" even to "immersion." On the river level, above Fulton, an old inhabitant who has kept a measurement for the past forty years, puts the water of last spring seventeen and a half inches the highest.

Respectfully yours,

M. S. KIMBALL.

The following article from an Oswego newspaper is inserted as a correct statement, and worthy of especial attention:

"Now that navigation on the Oswego canal has been resumed, it is but simple justice to the canal officers to give a comparative statement exhibiting the energy with which the work of repairs at High Dam has been prosecuted.

"On the 5th day of October, 1837, ninety feet of High Dam was carried away. The facilities for quick repairs were plenty of men at low wages—one hundred being then at hand—plenty of timber, stones, brush and other material in close proximity, three State scows, well manned and well furnished with tools,—and all under the control and management of Superintendent A. M. Childs, one of the most efficient officers the State has ever had, and who was ably seconded by another experienced canal man, Mr. F. D. Van Wagoner, of Phœnix. The repairs were made by sinking cribs, fourteen feet by twenty feet, in fourteen feet of water. Five cribs were required to close the gap, and in putting them in three were lost. The time consumed in so far repairing the dam as to render it useful, or in bringing it to the present condition, was *three months lacking seven days.*

"The unprecedented freshet of March last again carried out a portion of the dam,—two hundred and ten feet, or *one hundred and twenty feet* more than went out in 1837. The water continued to rise after the disaster, but on the 14th of April the work of repairs was commenced by Superintendent Hart, who placed Mr. F. D. Van Wagoner in immediate charge. Men were very scarce, and high prices for labor were demanded. There was no timber to be had, as most sawmill dams had been carried away by the freshet,

and the broadaxe had to be resorted to. No State-scows could reach the work, and it was commenced under the greatest embarrassment. The plan of repairs adopted was to sink cribs, and the work was commenced. The depth of water was from twenty to thirty feet, and the volume of water largely increased by the freshet. All means that could in any way hasten the work were employed. Canal officers gave it their closest attention and made the work a specialty. Finally the dam was restored as in 1837, three cribs having been lost. The largest and heaviest crib sunk had a computed weight of over *ten hundred tons.*

"The magnitude of and difficulties upon this work, can only be appreciated by those familiar with the force of water in such volume, and the fearful power it exerts under such head as is required at this dam. The work has been visited by many of the best engineers and canal men in the State, whose opinion has invariably been given that the repairs of this dam were the most difficult and most uncertain of any heretofore attempted on any of the public works of the State; and also that the plans for its repairs, adopted by the engineers and approved by the Canal Commissioners, were the only ones which could succeed.

"Navigation was restored on the eighth day of June, fifty-four days from the day the work was commenced. Thus the comparison stands:

Number of days required in 1837 to repair ninety feet	87
Number of days required in 1865 to repair two hundred and ten feet	54
Days difference in favor of 1865	33

"Those familiar with the extent and character of the work, and the embarrassments under which those in charge of it labored, can best appreciate the entire success attending it. The dam is now regarded as safe, and when fully completed will withstand any and all freshets."

Dams.

The work upon the Phœnix dam has progressed throughout the season, and is now about three-fourths completed, and preparations are making that will insure its completion early the coming season. The dams at Oswego Falls, Braddock's Rapids and Minitto, have so often been reported unsafe for the maintenance of canal navigation that a repetition seems uncalled for, but it is earnestly recommended that immediate steps be taken to rebuild all of the above dams of stone, that the navigation of the Oswego

canal may not be exposed to a recurrence of the experience of last spring, caused by the failure of High dam, the rebuilding of which had been recommended each year for the last eight years, but omission to do so resulted in the most disastrous break known in the history of the canals of this State.

The weigh-lock at Oswego will be completed by the opening of navigation next season.

A new towingpath bridge has been built across the Oneida river at Three River Point.

The building of a berm bank from the lock at Hinmansville to Horseshoe dam lock is in progress, and it is hoped that another season will so far complete it as to permit the abandonment of Horseshoe dam, which, like the other old wooden dams, is of doubtful security.

A new river bridge will be required at Cold Spring upon section No. 1 during the coming year.

Bloody Brook culvert, near the village of Liverpool, has been a source of much trouble since its construction, and involving great damage to parties owning property at that point. This culvert is too small, and being of necessity of a diving construction, it is impossible to pass the large amount of water required in times of ordinary freshets. Some plan should be adopted to relieve the owners of property of the damage that is yearly suffered by them in consequence of the inadequate capacity of this structure. It is recommended that an act be passed authorizing the construction of a suitable culvert at that point.

CAYUGA AND SENECA CANAL.

Navigation upon this canal during the past year has suffered no detention except for three days to replace a set of gates in the upper lock at Waterloo. A number of new lock gates will be required, and the chambers of the locks must be thoroughly inspected and repaired before the commencement of business next spring. The locks upon this canal are on the "composite plan," and are a source of great annoyance and considerable expense to keep in repair. It is believed as a matter of economy that the dry walls should be taken up and relaid in cement masonry upon the plan adopted for repairing the Chenango locks. The brush and stone dams at Seneca Falls and Burno Brook are with much difficulty

kept in repair, and will continue to be until rebuilt of more substantial materials.

A new towingpath bridge has been constructed over the outlet of Cayuga lake, and most of the other bridges have been repaired. One of the iron bridges at Waterloo was broken down and has been replaced.

A new towingpath bridge over Seneca river will be required at Seneca Falls to replace the old structure, which is unsafe.

A waste-weir should be constructed at Seneca Falls between locks Nos. 3 and 4, to discharge the surplus water from the canal into the river.

CHEMUNG CANAL.

The floods in March last caused great damage to this canal, particularly at and near Corning, and between Millport and Havana.

At Corning the work under contract for the improvement of the Chemung river was very badly injured, as was also private property at that point.

The change bridge across the river was mostly swept away, and the plan of maintaining a bridge at that point has been abandoned, —re-establishing the towingpath on its former location. The docking has been extended as far as contemplated, and the whole work is so far advanced that its completion may be relied upon before the usual spring floods.

A large break was made in the guard bank connecting with the dam at Gibson, and the protection at ends of dam and at the guard lock was badly damaged by the March flood; also several heavy breaks occurred in the towingpath bank below Millport. This work was so far repaired as to permit the opening of navigation last spring at the time fixed by the Canal Commissioners, and it is believed that navigation has never been better than during the past season.

Two locks (Nos. 8 and 26) were reconstructed last spring, leaving but seven (viz. 1, 24, 25, 28, 32, 36 and 40) yet to be rebuilt.

The Commissioners have advertised for proposals for repairing the seven remaining locks the coming winter. A good deal of difficulty has been experienced to maintain the depth of water required to properly float boats drawing the amount of water now allowed by the canal regulations (viz. four feet) without flooding

the banks. The banks have been raised and strengthened in many places, particularly on the feeder, but there is much more to be done before navigation can be considered entirely reliable for boats drawing four feet of water.

Some improvements will undoubtedly be required in the harbor at Watkins, at the head of Seneca lake, in order to facilitate the passage of boats from the canal into the lake, and the transhipment of coal upon boats of the enlarged class from the railroad; of which a large business is being done at that point. An appropriation for this purpose is recommended.

CROOKED LAKE CANAL.

This canal passed the flood last spring without any serious damage to either its banks or structures, and good navigation has been maintained.

The banks have been protected within a few years so that no great outlay need be anticipated, though the constant changing of the direction of the stream passing down the valley of the Crooked lake requires great watchfulness, and no doubt points will require further protection.

The Penn Yan level has been depressed to conform to the mitre sill of the new guard-lock, which was a work that has been needed for a long time.

New bridges have been constructed at foot of lock No. 4 and at Dresden.

The channel of Dox brook has been cleaned out and its banks protected. This is a work that has been greatly needed for a long time, and will prevent the difficulty that has been heretofore experienced in keeping the channel of the canal clear in time of freshets or heavy rains. The locks were well repaired last spring, and have passed the season without serious trouble, but the timber lining to the twenty-seven "composite locks" will require renewing, or the dry wall relaid, as recommended for Cayuga and Seneca canal locks, before many years.

CHENANGO CANAL.

During the suspension of navigation last winter, lock No. 100 was partially reconstructed upon the plan adopted four years ago, making eight locks that have been substantially rebuilt, viz: Nos.

86, 87, 89, 99, 100, 103, 104 and 109. It has been recommended by the engineers that six others, viz: Nos. 56, 60, 77, 105, 106 and 107, be rebuilt the coming winter, and the Commissioners have advertised for proposals to perform the work.

Most of the locks upon this canal will, of necessity, require rebuilding or partial reconstruction before many years; and the policy of rebuilding a small number each year is again recommended, as without it it is believed that navigation cannot long be maintained.

The freshet of last spring caused great damage upon sections Nos. 2 and 3, the repairs of which have been attended with much difficulty, and has required the expenditure of large sums of money.

The waters of the Chenango river raised several feet higher than ever before known, completely inundating the canal for several miles, particularly between Binghamton and Chenango Forks, where the greatest damage was done. The bank adjoining the river was washed entirely away for a long distance, and badly broken up for the remaining portion. The repairs of this work was conducted by the contractor with diligence, until about the first day of June, when the water was let into the canal. A good deal of difficulty was experienced to secure water enough to supply the levels from Stratton feeder to Chenango Forks, in consequence of the damage done to Oxford and Stratton feeder dams. It was impracticable to repair these structures until the high water should subside and the extent of the damage become known.

The top of the dam at Oxford was carried away from one to three feet in depth, and one hundred and forty feet in length of Stratton feeder dam was washed entirely away for the depth of some fifteen feet. Since these dams were repaired a full supply of water has been maintained.

Upon section No. 2 there was a large number of breaks in the canal and feeder banks, and the surface of the towing-path was washed off for much of the distance.

So much difficulty was experienced last season in supplying sections with water, that it was determined to have the feeders thoroughly cleaned out, and in pursuance of orders issued to the contractors, the West Branch, Bradley Brook and Madison Brook feeders were thoroughly bottomed out to their original capacity, and during the past season the importance of the work has been fully demonstrated, as has also the fact that the feeders are amply

sufficient to supply the wants of the portion of the canal fed from reservoirs, and with the completion of Kingsley Brook reservoir there will be no lack of water.

Some detention to navigation has been experienced during the past season from failure of lock-gates and one small break at lock 99, aside from which, navigation has been good since a full supply of water was secured by the repairs of the dams.

New gates and lining will be required in many of the locks, and the trunks of several aqueducts must be thoroughly repaired during the next winter; when done, and the canal prism properly cleaned out (as must be done every year), good navigation will be continued.

The regulation adopted last spring prohibiting boats upon this canal passing the locks between sun down and sun rise, except especially permitted to do so by the Canal Commissioner or superintendent, has worked to the entire satisfaction of the officers of the canal, and has resulted greatly to the advantage of boatmen and forwarders as well as to the canal interest.

Kingsley Brook Reservoir.

This work has progressed throughout the season with a force that warrants the assertion that the reservoir will be so nearly completed next spring that it may be allowed to fill, and the canal will receive the full benefit of the accumulated water by the time required. The bank of the reservoir is now nearly to its original height, and a suitable waste-weir is being constructed to discharge the surplus water after the reservoir becomes filled. The want of such a structure was the cause of the breaking away of the reservoir soon after its original construction.

With this reservoir completed to the capacity contemplated in the original design, there can be no doubt the means for obtaining water for the Chenango canal will be ample, with the additional business that will likely follow from the completion of the extension.

Extension of the Chenango Canal.

Surveys of location and estimates of cost of the whole line have been made during the year, and ten miles of this work, together with the structures located thereon placed under contract, to be completed by the first day of September, 1866.

At the letting, held at Binghamton June 22d, a large number of contractors were in attendance, and an unprecedented number of

bids received and the work awarded at prices far below the estimates of the engineers, as will be seen by reference to the tables hereto attached. It is a matter of congratulation that during the year 1865, when prices of labor and materials of all kinds were excessively high, the construction of this important branch of the public works could be secured at prices so nearly those of former times; and no doubt the remaining portion of the work may be let at prices fully as advantageous to the State as have the ten miles already under contract.

The contractors upon several of the sections have commenced work, and preparations are in progress to commence the remaining portion under contract without delay. Attention is directed to the tables hereto attached for further information in regard to this subject.

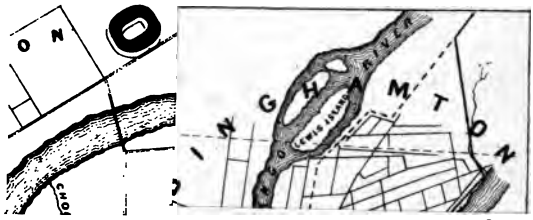
Table No. 1 exhibits the Engineer's estimate, estimated cost at contract prices, amount done in 1865, whole amount done, and amount remaining to be done upon that portion of the work under contract.

Table No. 2 exhibits the engineer's estimate at contract prices in detail, the length of section, number and character of structures, and name of contractor to whom the work is awarded.

TABLE No. 1.

Extension of Chenango Canal.

Character of Work.	Engineer's estimate.	Est'ted cost at contract prices.	Amount done during fiscal year.	Whole am't done.	Amount remaining to be done.
Section No. 1..	$13,095 00	$8,578 00	$2,940 00	$2,940 00	$5,638 00
do 2.....	57,915 00	28,049 00	.....	.....	28,049 00
do 3.....	34,595 00	29,952 00	.....	.....	29,952 00
do 4.....	92,670 00	48,212 00	.....	.....	48,212 00
do 5.....	56,690 00	30,309 00	4,600 00	4,600 00	25,709 00
do 6.....	50,695 00	28,315 00	100 00	100 00	28,215 00
do 7.....	43,095 00	25,500 00	580 00	580 00	24,920 00
do 8.....	21,285 00	13,437 00	2,240 00	2,240 00	11,197 00
do 9.....	12,745 00	8,450 00	3,360 00	3,360 00	5,090 00
do 10.....	15,430 00	9,780 00	2,820 00	2,820 00	6,960 00
Bridges on sections Nos. 1, 2, 3, 4 and 5.....	12,930 00	9,878 00	.....	.....	9,878 00
Bridges on sections Nos. 6, 7, 8, 9 and 10.....	18,934 00	14,393 00	.....	.....	14,393 00
Culverts on sections Nos. 1, 2, 3, 4 and 5.....	7,715 00	6,542 00	.....	.....	6,542 00
Culverts on sections Nos. 6, 7, 8, 9 and 10.....	9,067 00	8,488 00	.....	.....	8,488 00
Lock No. 1.....	12,247 00	9,192 00	.....	.....	9,192 00
do 2.....	11,872 00	8,625 00	.....	.....	8,625 00
do 3.....	12,822 00	9,544 50	.....	.....	9,544 50
	$483,802 00	$297,244 50	$16,640 00	$16,640 00	$280,604 50


G H A M
T O N

SECTION No. 4—*Eighty chains long.*

GEORGE D. LORD, *Contractor.*

7.50 acres grubbing and clearing	$30 00		$225 00
1 No., bailing and draining	500 00		500 00
74,000 cubic yards excavation of earth	30		22,000 00
49,000 do embankment	10		4,900 00
3,000 do lining	50		1,500 00
8,500 do puddling	10		850 00
17,000 do slope and protection wall	1 00		17,000 00
1,000 do loose stone	90		900 00
5,000 f. b. m. hemlock	25 00		125 00
100 pounds spikes and nails	12		12 00
Total			$48,212 00

SECTION No. 5—*Ninety chains long.*

CHAS. A. DANOLDS, *Contractor.*

3.50 acres grubbing and clearing	$100 00		$350 00
1 No., bailing and draining	25 00		25 00
61,000 cubic yards excavation of earth	16		9,760 00
3,000 do do solid rock	80		2,400 00
2,000 do do quarried rock	80		1,600 00
31,000 do embankment	16		4,960 00
2,000 do lining	10		200 00
2,300 do puddling	10		230 00
7,300 do slope and protection wall	1 38		10,074 00
500 do loose stone	1 00		500 00
5,000 f. b. m. hemlock	20 00		100 00
100 pounds spikes and nails	10		10 00
10 rods road	10 00		100 00
Total			$30,309 00

SECTION No. 6—*Ninety chains long.*

CHAS. A. DANOLDS, *Contractor.*

1.00 acre grubbing and clearing	$100 00		$100 00
1 No. bailing and draining	25 00		25 00
141,000 cubic yards excavation of earth	15		21,150 00
1,000 do do solid rock	1 25		1,250 00
500 do do quarried rock	75		375 00
16,000 do embankment	13		2,080 00
1,000 do lining	10		100 00
2,500 do slope and protection wall	1 25		3,125 00
5,000 f. b. m. hemlock	20 00		100 00
100 pounds spikes and nails	10		10 00
Total			$28,315 00

SECTION No. 7—*Eighty chains long.*

CHAS. A. DANOLDS, *Contractor.*

1 No. bailing and draining	$50 00		$50 00
91,000 cubic yards excavation of earth	17 00		15,470 00
48,000 do embankment	15		7,200 00
1,000 do lining	12		120 00
6,000 do puddling	10		600 00
1,300 do slope and protection wall	1 50		1,950 00
5,000 f. b. m. hemlock	20 00		100 00
100 pounds spikes and nails	10		10 00
Total			$25,500 00

SECTION No. 8—*Eighty chains long.*

GEO. D. LORD, *Contractor.*

1.00	acre grubbing and clearing	$30 00	$30 00
1	No. bailing and draining	500 00	500 00
59,000	cubic yards excavation of earth	16	9,440 00
21,000	do embankment	15	3,150 00
5,000	f. b. m. hemlock	25 00	125 00
100	pounds spikes and nails	12	12 00
20	rods road	9 00	180 00
	Total		$13,437 00

SECTION No. 9—*Eighty chains long.*

WM. T. DENISON, *Contractor.*

0.30	acre grubbing and clearing	$50 00	$15 00
1	No. bailing and draining	10 00	10 00
26,400	cubic yards excavation of earth	17	4,488 00
20,000	do embankment	19	3,800 00
5,000	f. b. m. hemlock	25 00	125 00
100	pounds spikes and nails	12	12 00
	Total		$8,450 00

SECTION No. 10—*Eighty chains long.*

LEWIS M. LOSS, *Contractor.*

0.80	acre grubbing and clearing	$100 00	$80 00
1	No. bailing and draining	100 00	100 00
25,000	cubic yards excavation of earth	20	5,000 00
30,000	do embankment	15	4,500 00
5,000	f. b. m. hemlock	18 00	90 00
100	pounds spikes and nails	14	14 00
	Total		$9,784 00

LOCK No. 1—*Seven feet lift.*

CLINTON STEPHENS, *Contractor.*

1	per lock grubbing and clearing	$5 00	$5 00
1	do bailing and draining	10 00	10 00
3,500	cubic yards excavation of earth	18	630 00
1,500	do embankment	18	270 00
300	do lining	45	135 00
150	do procuring and puddling in gravel	30	45 00
100	do slope wall	1 50	150 00
775	do rubble masonry in cement	6 50	5,037 50
20	do coping	10 00	200 00
12,000	f. b. m. white oak	45 00	540 00
11,300	do do pine	30 00	339 00
49,000	do hemlock	18 00	882 00
2,000	pounds wrought iron	20	400 00
1,300	do cast iron	20	260 00
1,500	do spikes and nails	25	375 00
60	lineal feet snubbing posts	40	24 00
1	per lock sulphur and sand cement	20 00	20 00
1	do painting	20 00	20 00
	Total		$9,342 50

LOCK NO. 2—*Seven feet lift.*

JOHN DAVIDSON, *Contractor.*

1	per structure	grubbing and clearing	$10 00	$10 00
1	do	bailing and draining	50 00	50 00
2,000	cubic yards	excavation of earth	25	500 00
1,500	do	embankment	20	300 00
300	do	lining	30	90 00
150	do	procuring and puddling in gravel	1 00	150 00
100	do	slope wall	1 50	150 00
775	do	rubble masonry in cement	6 00	4,650 00
20	do	coping	10 00	200 00
12,000	f. b. m.	white oak	50 00	600 00
11,300	do	do pine	40 00	452 00
49,000	do	hemlock	17 00	833 00
2,000	pounds	wrought iron	15	300 00
1,300	do	cast iron	10	130 00
1,500	do	spikes and nails	10	150 00
60	lineal feet	snubbing posts	50	30 00
1	per lock	sulphur and sand cement	20 00	20 00
1	do	painting	10 00	10 00
		Total		$8,625 00

LOCK NO. 3—*Seven feet lift.*

A. CADWELL BELDEN.

1	per lock	grubbing and clearing	$1 00	$1 00
1	per lock	bailing and draining	300 00	300 00
2,200	cubic yards	excavation of earth	18	396 00
1,500	do	embankment	18	270 00
300	do	lining	30	90 00
150	do	procuring and puddling in gravel	30	45 00
100	do	slope wall	2 00	200 00
775	do	rubble masonry in cement	6 90	5,347 50
20	do	coping	10 00	200 00
12,000	f. b. m.	white oak	60 00	720 00
11,300	do	do pine	40 00	452 00
49,000	do	hemlock	20 00	980 00
2,000	pounds	wrought iron	12	240 00
1,300	do	cast do	10	130 00
1,500	do	spikes and nails	10	150 00
60	l. ft.	snubbing posts	20	12 00
1	per lock	sulphur and sand cement	1 00	1 00
1	do	painting	10 00	10 00
		Total		$9,544 50

ALL BRIDGES ON SECTIONS NOS. 1, 2, 3, 4 & 5—*Six in number.*

R. NELSON GERE, *Contractor.*

1	per group	bailing and draining	$1 00	$100 00
700	cubic yards	excavation of earth	25	175 00
800	do	embankment	25	200 00
90	do	procuring and puddling in gravel	40	36 00
300	do	slope wall	1 50	450 00
973	do	rubble masonry in cement	6 00	5,838 00
18	do	coping	6 00	108 00
2,700	f. b. m.	white oak	40 00	108 00
54,000	do	do pine	35 00	1,890 00
24,000	do	hemlock	20 00	480 00
1,750	pounds	wrought iron	10	175 00
130	do	cast do	10	13 00
550	do	spikes and nails	10	55 00
5	per structure	painting	50 00	250 00
		Total		$9,878 00

All Bridges on Sections Nos. 6, 7, 8, 9 & 10—*Eleven in number.*

R. Nelson Gere, *Contractor.*

1	per group	bailing and draining	$100 00	$100 00
1,100	cubic yards	excavation of earth	25	275 00
1,100	do	embankment	25	275 00
110	do	procuring and puddling in gravel	40	44 00
550	do	slope wall	1 50	825 00
1,375	do	rubble masonry in cement	6 00	8,250 00
33	do	coping	6 00	198 00
2,500	f. b. m.	white oak	40 00	100 00
74,000	do	do pine	35 00	2,590 00
42,000	do	hemlock	20 00	840 00
2,300	pounds	wrought iron	10	230 00
160	do	cast do	10	16 00
1,000	do	spikes and nails	10	100 00
11	per structure	painting	50 00	550 00
		Total		$14,393 00

All Culverts on Sections Nos. 1, 2, 3, 4 & 5—*Three in number.*

R. Nelson Gere, *Contractor.*

44	square rods	grubbing and clearing	$3 00	$132 00
3	per structure	bailing and draining	75 00	225 00
2,100	cubic yards	excavation of earth	30	630 00
900	do	embankment	25	225 00
450	do	lining	40	180 00
190	do	procuring and puddling in gravel	40	76 00
430	do	rubble masonry in cement	5 00	2,150 00
135	do	masonry in arches	10 00	1,350 00
15	do	coping	10 00	150 00
500	f. b. m.	white oak	50 00	25 00
7,400	do	do pine	40 00	296 00
39,000	do	hemlock	25 00	975 00
190	pounds	wrought iron	15	28 50
50	do	cast do	10	5 00
950	do	spikes and nails	10	95 00
		Total		$6,542 50

All Culverts on Sections Nos. 6, 7, 8, 9 & 10—*Six in number.*

R. Nelson Gere, *Contractor.*

96	square rods	grubbing and clearing	$3 00	$288 00
6	per structure	bailing and draining	75 00	450 00
2,500	cubic yards	excavation of earth	30	750 00
1,700	do	embankment	25	425 00
600	do	lining	40	240 00
300	do	procuring and puddling in gravel	40	120 00
380	do	rubble masonry in cement	6 00	2,280 00
34	do	masonry in arches	10 00	340 00
25	do	coping	10 00	250 00
3,600	f. b. m.	white oak	50 00	180 00
40,000	do	do pine	40 00	1,600 00
52,000	do	hemlock	25 00	1,300 00
1,000	pounds	wrought iron	15	150 00
250	do	cast do	10	25 00
900		spikes and nails	10	90 00
		Total		$8,488 00

BALDWINSVILLE CANAL.

The old guard lock at Baldwinsville, originally built of timber, has become so decayed, that no reliance can be placed upon it for sustaining the head that it must necessarily bear in time of high water in Seneca river. Something must be done at that point in order to maintain navigation upon this canal; and in view of the fact that navigation upon the Seneca river above the guard lock is impracticable except in times of ordinary low water, it is deemed expedient to dispense with the lock and substitute in its place a guard gate that will allow the passage of boats at such times as the gates may be thrown open.

It is recommended that a guard gate be built of stone at the point above indicated, and that the sum of $10,000 be appropriated therefor, which amount it is believed would be ample to erect a substantial structure.

By act, chap. 621, Laws of 1865, the Canal Commissioners were authorized to rebuild the bridge over the State ditch at Jack's Reefs at an expense not to exceed the sum of three thousand dollars; but as there was no clause in the act making an appropriation to pay for the bridge when completed, nothing has been done. The old bridge is in a very unsafe condition, and should be rebuilt immediately. The attention of the Legislature is called to the defect in the act above mentioned.

FINANCIAL STATEMENTS ACCOMPANYING THE ANNUAL REPORT OF THE CANAL COMMISSIONER IN CHARGE OF THE MIDDLE DIVISION OF THE NEW YORK STATE CANALS, FOR THE FISCAL YEAR ENDING SEPTEMBER 30, 1865.

STATEMENT No. 1, *showing the canals, feeders and reservoirs in charge of the Commissioner.*

CANALS.

	Miles.
1. The Erie canal, from Higginsville, Oneida county, to the county line between Seneca and Wayne counties, including Limestone, Butternut and Nine Mile Creek feeders, each navivable one mile	71.93
2. The Oneida Lake canal, including towing-path on Wood creek, six miles, the Oneida feeder, falling into the canal at Durhamville, and navigable one mile.	7.
3. The Oswego canal	38 00
4. Oneida River improvement	20.
5. Seneca River towing-path	5.75
6. Seneca River improvement, at Baldwinsville, including three-quarters of a mile of slack-water navigation, without any towing-path from Baldwinsville to Jack's reefs	12.50
7. Cayuga and Seneca canal	22.77
8. Cayuga inlet	2.
9. Crooked Lake canal	8.
10. Chemung canal	23.
11. Chemung canal feeder	16.
12. Chenango canal	97.
Total	323.95

RESERVOIRS AND FEEDERS.

	Areas, acres.	Depth, feet.	Length of feeder, miles.	
Erieville	340	21½	20	
Hatch's lake	134	10	8	to Bradley brook reservoir.
Eaton brook	254	50	8	
Bradley brook	134	25	3	to Eaton brook feeder.
Leland pond	173	8	¼	
Woodman's lake	148	11	¼	
Madison brook	235	45	2	
Skaneateles lake	8,320	..	9	
Cazenovia lake	1,778	4½	10	
De Ruyter	626	18½ average.	25	

TABLE No. 1,

Showing the names of canals, superintendents of repairs, and contractors thereon; date and expiration of contracts, and the annual compensation paid to repair contractors.

CANALS.	No. of sec.	Superintendents.	Contractors.	Annual compensation.	Date of contract.	Expiration of contract.
Erie	7	Joseph Breed	Thomas Gale	$5,653 80	May 1, 1861	April 30, 1866
Erie	8	Joseph Breed	Myron Bangs	6,500 00	Mar. 1, 1865	Dec. 31, 1868
Erie	9	Joseph Breed	C. J. Hayden	11,270 00	May 1, 1861	April 30, 1866
Chemung	All	H. P. Haskin	Jarvis Lord, assignee	25,536 00	April 1, 1862	Dec. 31, 1866
Chenango	1	C. H. Smith	A. Peck & Co	20,985 00	May 1, 1862	April 30, 1866
Chenango	2	L. R. Hitchcock	Daniel McGarry	16,400 00	Oct. 1, 1864	Dec. 31, 1867
Chenango	3	L. R. Hitchcock	Snook & Beebee, assignees	10,710 00	May 1, 1861	April 30, 1866
Oneida lake	All	Joseph Breed	W. R. Chapman	2,375 00	Oct. 1, 1860	Sept. 30, 1865
Oswego	1	A. P. Hart	William Avery	12,150 00	May 1, 1862	Dec. 31, 1866
Oswego	2	A. P. Hart	*Charles E. Case	17,850 00	May 1, 1862	Dec. 31, 1866
Cayuga and Seneca	All	Joseph Breed	George M. Case	14,029 50	July 1, 1862	Dec. 31, 1866
Crooked lake	All	H. P. Haskin	†Farley Holmes, assignee	5,996 95	Oct. 1, 1860	Sept. 30, 1865
Total				$149,456 25		

* Abandoned March 12th, and relet to A. Cadwell Belden, from Oct. 1, 1865, to Dec. 31, 1868, at the rate of $21,000 per annum.

† Relet to R. Nelson Gere, from Oct. 1, 1865, to Dec. 31, 1868, at the rate of $6,990 per annum.

STATEMENT No. 2.—*Description of Sections and Expenditures thereon.*

ERIE CANAL.

The Middle Division of the Erie canal extends from the eastern bank of the Oneida Lake canal to the east line of Wayne county, seventy-two miles, and comprises three repair sections, as follows:

REPAIR SECTION No. 7.

This section embraces twenty-seven miles of the Erie canal, extending from the Oneida Lake canal to the Limestone creek feeder; the Oneida creek feeder, two miles in length, navigable from Durhamville to Oneida, a distance of one mile; and the Erieville and Cazenovia Lake reservoirs and Chittenango feeder. Total 29 miles. The structures are: 2 aqueducts, 23 culverts, 1 wooden lift lock (Oneida feeder), 5 iron bridges, 3 wooden farm bridges, 15 wooden road bridges, 1 guard gate (Oneida feeder), 3 waste weirs, 3 feeder dams, 2 guard gates.

The expenditures upon this section during the fiscal year were as follows (all marked thus * being ordered by the Canal Board):

DRAFTS ON AUDITOR.

For repairs per contract, including two months percentage retained in 1864, $87.24	$5,741 04	
For puddle ditch at Canastota*	413 35	
For bridge at Limestone creek	469 01	
For part salary Canal Commissioner	750 00	
For fender timbers at Chittenango creek aqt.*	71 76	
For gate house over paddles, Cazenovia Lake reservoir*	329 56	
For securing lower dam at ditto*	429 00	
For raising berm bank at Oneida creek*	1,009 36	
For new bridge at outlet of Erieville and Cazenovia Lake reservoirs,	6,034 20	
		$15,247 28

SUPERINTENDENT'S EXPENDITURES.

For stop gates at Durhamville*	$2,464 57	
For salary superintendent and clerk hire	399 99	
		2,864 56

Miscellaneous Expenditures*

D. P. Forrest, clerk Contracting Board	$200 35	
Howard Soule, Jr., services as inspector	393 09	
Joanna E. Tehan, cleaning offices	49 00	
Truair, Smith & Miles, publishing notices	35 33	
D. H. Bruce, clerk Canal Commissioner	498 15	
American Express Company, Albany agent	30 80	
Charles E. Breed, fuel	2 68	
Truair, Smith & Miles, blanks for letting	37 00	
Charles A. Beach, services as inspector	137 68	
E. R. Holden, agent, coal	20 98	
Syracuse Water Works Co., rent two years	38 75	
J. Winnie & Son, furniture Commissioners' office, Albany	15 00	
Franklin Tanner, letter box Com. office	6 00	
D. McCarthy & Co., carpet Commissioners office	14 04	
B. F. Bruce, travel, official duty	50 00	
Wm. D. Dunning, disbursements	9 30	
Dawson & Co., publishing notice	39 67	
Wm. D. Dunning, inspector	341 03	
Jno. W. Parker, repairs Commissioners office, Albany	36 05	
E. H. Bender, stationery	59 67	
Western Union Telegraph Co., Albany, messages	5 97	
Michael Murray, sawing wood	3 00	
Western Union Telegraph Co., Syracuse, messages	62 43	
F. H. Little, stationery, Albany office	77 84	
P. H. Agan, P. M., postage	29 38	
H. C. Brower, repairs locks	3 19	
Denis Cary, sawing wood	6 25	
Hulbert Vroman, cleaning walks	5 00	
John O'Hara, services as inspector	43 33	
Sprague Brothers, check book	30 00	
D. B. Killmore, fuel	2 75	
U. S. Telegraph Co., messages	2 98	
M. Barker, whitewashing	5 00	
Wynkoop & Brother, stationery and wall paper	80 38	
C. Cook, repairs, awnings	6 00	
Ed. Drake, repairs stove	6 19	
		2,383 76
Total expenditures on section No. 7		$20,495 60

Repair Section No. 8.

This section extends from Limestone creek feeder to lock No. 50, above Geddes, including Limestone and Butternut feeders, each navigable one mile; total 13 miles. The structures are: 3 double stone lift-locks, 2 aqueducts, 4 culverts, 1 weigh-lock, 1 wooden farm bridge, 3 wooden feeder bridges, 1 wooden towing-path bridge, 9 wooden road bridges, 2 iron tow-path bridges, 7 iron road bridges, 1 iron foot bridge, 1 feeder dam, 1 waste weir, 3 lock houses, 1 State shop.

The expenditures upon this section during the fiscal year were as follows (all marked thus * being ordered by the Canal Board):

* The "miscellaneous expenditures," in support of the Commissioner's office, are distributed and charged to the account of the three sections composing the middle division of the Erie canal.

Drafts on Auditor.

For repairs per contract	$3,222 94	
For return of deposit with interest to late contractor	4,427 31	
For raising north approach Clinton street bridge*	1,822 31	
For difference between a slope and vertical wall at glass works*	450 39	
For slope wall elsewhere changed to vertical*	1,617 83	
For wall at gas works*	1,202 25	
For repairs weigh-lock on change of plan	346 42	
For vertical wall near Barker's mill*	308 00	
For part salary Canal Commissioner	250 00	
		$13,647 45

Superintendent's Expenditures.

For labor making general repairs from Oct. 1, 1864, to March 1, 1865, section not being under contract	$1,405 23	
For timber and lumber for ditto	1,370 28	
For tools for ditto	80 23	
For repairs locks and bridges	401 80	
For paint and oil for bridges	21 05	
For schedule tools of late repair contractor	2,087 03	
For lock tending	2,281 54	
For watchmen on section and reservoirs	130 50	
For repair scow	200 00	
For oil for locks	37 40	
For oak timber for lock gates in reserve	1,000 00	
For miscellaneous repairs weigh-lock	105 30	
For culvert under Limestone creek feeder	2,542 12	
For removing piers at west end weigh-lock*	230 65	
For relaying vertical wall east end weigh-lock*	552 00	
For securing banks De Ruyter reservoir	40 25	
For rebuilding West street bridge*	1,574 31	
For rebuilding Gere's bridge*	1,100 35	
For extending abutments West street bridge *	396 25	
For superintendent's salary and clerk hire	399 99	
Miscellaneous	92 96	
		15,949 24

Miscellaneous Expenditures.

D. P. Forest, late clerk contracting board	$117 15	
Howard Soule, jr., services as inspector	604 09	
Joanna E. Tehan, cleaning offices	29 00	
Truair, Smith & Miles, publishing notices	35 33	
Truair, Smith & Miles, letting blanks	37 00	
D. H. Bruce, clerk Canal Commissioner	388 33	
American Express Company, freight	20 48	
Chas. R. Breed, wood	2 66	
Chas. A. Beach, services as inspector	137 66	
E. R. Holden, agent, coal	20 96	
J. Winnie & Son, furniture, Albany office	15 00	
Western Union Telegraph Company	61 12	
Peter Way, chains and locks for weigh-lock	3 50	
D. McCarthy & Co., carpet, Commissioner's office	14 04	
B. F. Bruce, travel, Canal Commissioner	50 00	
F. T. Carrington, wood, Commissioner's office	13 50	
Wm. D. Dunning, services as inspector	340 98	
Jno. W. Parker, repairs Commissioners' office, Albany	36 05	
E. H. Bender, stationery, Board Canal Commissioners	59 66	
Everett Hollenbeck, kindling wood	4 40	
S. C. Hayden, furniture, Canal Commissioners' office	20 50	
Frank H. Little, stationery, Board Canal Commissioners	77 83	
J. M. Baker, painting and glazing	13 40	
Tucker & Crawford, repairs gas pipes and water cooler	11 50	
Wynkoop & Brother, stationery	33 71	
John Hamilton, wood	20 00	
John O'Harra, services as inspector	43 34	
Summers & Brother, publishing notices	74 25	
John Crawford, do	74 25	
M. Tehan, services as inspector	50 00	
Caroline White, cleaning offices	5 00	
Connelly Brothers, wall paper for offices	50 80	
H. C. Brower, repairs of locks	2 50	
		2,467 99
Total expenditures on section No. 8		$32,064 68

Repair Section No. 9.

This section extends from the foot of lock No. 50 to the east line of Wayne county, embracing the Skaneateles lake and feeder, and the Camillus feeder, navigable one mile; total 35 miles.

The structures are: 3 double stone lift locks, 6 aqueducts, 2 waste weirs, 6 culverts, 1 wooden change bridge, 11 wooden road bridges, 6 wooden farm bridges, 11 iron road bridges, 1 iron foot bridge, 2 guard gates, 4 feeder dams, 3 receivers.

The expenditures upon this section during the fiscal year were as follows: (all marked thus * being ordered by the Canal Board.)

Drafts on Auditor.

For repairs per contract, including two months percentage retained in 1864, $175,	$11,445 00	
For part salary Canal Commissioner	250 00	
		$11,695 00

Superintendent's Expenditures.

For towing path on berm bank at Montezuma*	$488 01	
For additional security to Montezuma banks*	1,416 00	
For salary superintendent and clerk hire	399 99	
		$2,304 00

Miscellaneous Expenditures.

D. P. Forrest, late clerk Contracting Board	$117 14	
Howard Soule, Jr., services as inspector	409 10	
Henry Parks, watching water at Montezuma, by direction of the late Commissioner	80 00	
Joanna E. Tehan, cleaning offices	29 00	
Truair, Smith & Miles, publishing notice	35 33	
Truair, Smith & Miles, printing blanks	37 00	
D. H. Bruce, clerk Canal Commissioner	333 34	
American Express Company, freight	11 78	
Charles R. Breed, wood	2 66	
Charles A. Beach, services as inspector	137 66	
E. R. Holden, agent, coal	21 96	
J. Winne & Son, Albany, furniture	17 00	
Western Union Telegraph Company, messages	67 56	
Tobey & Snow, duster for Com'r office	2 50	
D. McCarthy & Co. carpet for Commissioner's office	14 04	
B. F. Bruce, travel Canal Commissioner	50 00	
Wm. D. Dunning, services as Inspector	461 99	
Jno. W. Parker, repairs Commissioners' office, Albany	36 05	
E. H. Bender, stationery	59 66	
W. C. Little, Session Laws	4 50	
Frank Torrey, watching water at Montezuma	200 00	
Frank H. Little, stationery	77 83	
John O'Hara, services as Inspector	43 33	
P. H. Agan, P. M., postage	16 00	
Charles Truesdell, services settling final account enlargement section No. 204* †	55 72	
Wm. Thorn, temporary occupation of land in 1857* †	192 00	
Margaret G. White, temporary occupation of land in 1857* †	300 00	
Jno. Bedford, kindling wood	6 60	
U. S. Telegraph Company, messages	9 45	
P. H. Agan, P. M. Syracuse, postage	29 55	
H. Woes, painting and paper hanging in offices in State building, Syracuse	82 20	
		$2,940 95
Total expenditures on section No. 9		$16,939 95

† Items of expense strictly belonging to the enlargement account and not to the repair [illegible].

OSWEGO CANAL.

This canal extends from Syracuse to Oswego—38 miles, and includes the Seneca river towing-path and Baldwinsville canal and the Oneida River Improvement. It is divided into two repair sections, as follows:

Repair Section No. 1.

This section extends from Syracuse to Three River Point, and includes the Seneca River towing-path and Baldwinsville canal. Total 21½ miles.

The structures are: 4 stone lift locks, 1 composite lift lock, 1 wooden lift lock, 1 wooden guard lock, 4 composite culverts, 5 iron road bridges, 1 iron change bridge, 11 wooden road bridges, 4 wooden change bridges, 2 floating tow path bridges, 1 wooden river dam, 3 waste weirs, 4 lock houses, 1 State shop.

The expenditures upon this section during the fiscal year were as follows: (all marked thus * being ordered by the Canal Board.)

Drafts on Auditor.

For repairs per contract, including two months percentage retained in 1864, $225	$12,375 00	
For rebuilding Green Point bridge	2,711 21	
For part salary Canal Commissioner	200 00	
For flood gates at Salina*	1,245 39	
		$16,531 60

Superintendent's Expenditures.

None.

Miscellaneous Expenditures.

Truair, Smith & Miles, publishing notice	$30 92	
Comstock & Cassidy, " "	37 09	
Dawson & Co., " "	63 41	
Summers & Brother, " "	18 15	
B. F. Bruce, travel Canal Commissioner	100 00	
Geo. Hosmer, livery for messenger	3 00	
D. H. Bruce, clerk Canal Commissioner	135 00	
		387 57
Total expenditures on section No. 1		$16,919 17

Repair Section No. 2.

This section extends from Three River Point to Oswego, including the Oneida River improvement (43 miles). The structures are: 13 stone lift locks, 5 stone guard locks, 2 steamboat lift stone locks 120 x 30, 5 wooden waste weirs, 7 wooden road bridges, 2 wooden road and change bridges, 6 wooden change bridges, 1 wooden river towpath and change bridge, 2 iron road bridges, 3 stone river dams, 6 wooden river dams, 1 aqueduct, 1 bulkhead, 1 drawbridge, 4 composite culverts, 20 lock houses, 1 State shop.

The expenditures upon this section during the fiscal year were as follows: (all marked thus * being ordered by the Canal Board.)

Drafts on Auditor.

For repairs per contract	$6,321 85	
For five cribs at Big Mills (balance)*	966 64	
For paid on account of weigh lock at Oswego*	21,233 00	
For paid on account of Phœnix dam*	17,333 00	
For paid on account of berme bank above Horseshoe dam*	15,045 00	
For paid on account of completion of reconstruction of High dam	20,247 00	
For new road bridge at Phœnix	1,161 09	
For dredging river level above Fulton*	1,197 50	
For securing end of Big Mill dam*	396 71	
For one crib at Big Mill*	359 68	
For balance final account for constructing lock No. 11 (enlargement account) paid under mandamus Supreme Court	1,040 22	
For part salary Canal Commissioner	200 00	
		85,501 69

Superintendent's Expenditures.

For lock tending	$5,011 75	
For oil for locks	8 95	
For new lock gates	6,356 68	
For repairs of old lock gates	4,440 24	
For repairs of waste weir at Fulton	13 50	
For replanking bridge at Oswego Falls	60 62	
For replanking bridge at Fulton	120 96	
For replanking three bridges on Phœnix level	230 84	
For repairs of Three River Point bridge	85 36	
For paid on account of rebuilding ditto	5,812 49	
For State scow and furnishing same	1,502 43	
For six small boats (repairs of dams) and repairs thereon	1,770 10	
For dredging out bars and removing sunken boats	2,057 01	
For repairs of lock houses, Nos. 1, 3, 4 and 6	66 87	
For repairs of high dam	109,652 88	
For repairs of stone dam at Oswego	344 12	
For repairs of Horse Shoe dam	3,228 05	
For repairs of Oswego Falls dam	883 40	
For repairs of Braddock's dam	735 09	
For repairs of Minetto dam	462 37	
For tools	887 50	
For repairs of breaches on Phœnix river level	1,473 66	
For repairs of breaches on Phœnix level	2,721 34	
For repairs of breaches on Horse Shoe dam level	1,330 57	
For repairs of breaches on Mossman's level	626 72	
For repairs of breaches on Fulton (upper) level	1,178 62	
For repairs of breaches on Fulton (middle) level	2,933 87	
For repairs of breaches on Fulton (lower) level	319 43	
For repairs of breaches on Van Buren's three mile level	2,234 55	
For repairs of breaches on Minetto level	28,031 42	
For repairs of breaches on High dam level	15,075 94	

For repairs of breaches on Oswego level	$495 99	
For docking timber	320 67	
For forty-six snubbing posts	34 50	
For repairs of State dredge	435 67	
For care of ditto through winter	270 00	
For towing dredge	46 00	
For use of boat in making surveys	7 50	
For inspector of berm bank	557 00	
For checking boats at Mud lock	75 00	
For mowing weeds on towing path	10 06	
For inspector vertical wall, Oswego, (old bill)	96 00	
For watching Coffer dam, Oswego weigh lock	80 00	
For inspectors services, general repairs	1,224 00	
For inspector's office at Fulton	172 24	
For assisting boats in crowd at Oswego	43 50	
For postage, telegraphing and stationery	46 59	
For salary superintendent and clerk hire	1,599 96	
		205,172 01

Miscellaneous Payments.

Truair, Smith & Miles, publishing notices	$202 12	
Comstock & Cassidy, do	37 09	
Calvin B. Burt, rent, Varick canal towing-path	100 00	
B. F. Bruce, travel, Canal Commissioner	50 00	
Dawson & Co., publishing notices	63 42	
W. H. Carter, lighting beacon at Brewerton, 1864	77 50	
R. L. Adams, publishing notice	29 02	
Bruce Kimball, services as inspector	192 00	
T. S. Brigham, publishing notices	34 35	
Patrick Corbett, counsel before Canal Appraisers	20 00	
		805 50
Total expenditures on section No. 2		$291,479 20

BALDWINSVILLE CANAL

Extends from the Oswego canal at Mud lock to Jack's reefs, a distance of 18.25 miles. It has principally slack-water navigation on the Seneca river, and is generally known as "Seneca River towing-path." The work is embraced in the repair contract for section No. 1, Oswego canal. Its structures are: 1 guard-lock, 1 lift-lock, 1 float bridge, 2 road bridges, 1 dam.

Superintendent's Expenditures.

For lock tending	$182 00	
For repairs of banks	126 75	
For inspector rebuilding dam (H. Whitney's old bill)	82 25	
Total expenditures on canal		$391 00

ONEIDA RIVER IMPROVEMENT

Extends from Three River Point to Oneida lake, a distance of 20 miles, and is embraced in the repair contract for section No. 2, Oswego canal.

Superintendent's Expenditures.

For lock tending at Oak Orchard and Caughdenoy	$310 00	
For repairs bank at Caughdenoy	407 75	
For repairs dam at Oak Orchard	411 09	
For driving piles at Oak Orchard	59 06	
Total expenditures on Improvement		$1,187 90

CAYUGA AND SENECA CANAL.

This canal extends from the Erie, at Montezuma, to Seneca lake, at Geneva, with a branch from lock No. 9 to East Cayuga, at the foot of Cayuga lake. Total miles in length 23. The structures are: 11 composite lift-locks, 1 side lock at Seneca Falls, 9 culverts, 1 pier at foot of Cayuga lake, 1 pier at foot of Seneca lake, 7 iron bridges, 15 wood bridges, 5 dams.

The expenditures upon this canal during the fiscal year, were as follows (all marked thus * being ordered by the Canal Board):

Drafts on Auditor.

For repairs per contract	$14,029 44	
For towing-path bridge over outlet of Cayuga lake, change of plan	1,074 76	
For improvement of Geneva harbor*	298 00	
For balance due for constructing a guard gate on section 9*	439 26	
For part salary Canal Commissioner	25 00	
		$15,866 46

Superintendent's Expenditures.

For lock tender at Mud lock	$325 27	
For repairs Mud lock	140 84	
For oil and snubbing posts	8 87	
For expenses moving State dredge and payment of hands	501 05	
For salary superintendent and clerk hire	399 99	
		1,376 02

Miscellaneous Expenditures.

Daniel Wheeler, lighting beacon at Geneva, and oil for same	$91 92	
Joseph Babcock, earth for retaining wall at Seneca Falls	100 00	
Mrs. C. T. Laird, temporary occupation of lands by State	25 00	
S. G. Hadley, State's counsel before Canal Appraisers	45 00	
I. N. Ives, superintending Ithaca inlet	82 50	
T. D. Wilcox, lighting beacon at Ithaca, and oil for same (1864)	100 00	
		444 42
Total expenditures on canal		$17,686 90

CROOKED LAKE CANAL.

This canal extends from Crooked lake, near Penn Yan, to Seneca lake, at Dresden—distance eight miles. The structures are: 27 lift locks, 1 guard lock, 6 waste wiers, 2 culverts, 14 bridges, 4 dams.

The expenditures upon this canal during the fiscal year were as follows:

DRAFTS ON AUDITOR.

For repairs per contract	$5,097 36	
For percentage retained from Oct. 1, 1863, to Sept. 30, 1864	660 21	
For securing banks, under resolution of Canal Board, passed November 30, 1864	2,291 98	
For sinking Penn Yan level, under resolution of Canal Board, passed December 17, 1863	1,898 19	
For repairs, pursuant to resolution of Canal Board, passed July 8, 1864	1,981 77	
For bridge at foot of lock No. 4	1,383 85	
For award Canal Board, making repairs not contemplated in repair contract, under resolution of Canal Board, passed Feb. 9, 1865	7,148 56	
For new bridge superstructure and abutments, at Dresden	2,133 73	
For award Canal Board, June 28, 1865, pursuant to requirements of act, chapter 261, Laws of 1865	14,382 88	
		$36,978 53

MISCELLANEOUS EXPENDITURES.

F Holmes, lighting beacon at Dresden	$167 74	
T. W. Amsbury, inspector	93 00	
		260 74
Total expenditures on canal		$37,239 27

CHEMUNG CANAL.

This canal extends from the head of Seneca lake, at Watkins, to Elmira, including the feeder from Horseheads to Knoxville, making a total distance of 39 miles of navigable canal.

The structures are: 2 composite locks, 13 timber locks, 1 timber guard lock, 38 old timber locks, 4 aqueducts, 13 waste weirs, 2 culverts, 1 dam and bulkhead, 3 road bridges, iron; 35 road bridges, wood; 14 farm bridges, 1 towing path bridge, wood; 1 towing path bridge across Chemung river.

The expenditures upon this canal during the fiscal year were as follows (all marked thus * being ordered by the Canal Board):

Drafts on Auditor.

For repairs per contract	$25,918 84	
For work in the Chemung river at Corning*	9,775 00	
For reconstructing lock No. 15 (final)	765 71	
For bridge at Horse Heads*	2,423 53	
For Snyder's patent draw bridge, on Cross street, Elmira*	1,900 00	
For bridge on Huy's farm*	1,350 23	
For iron bridge on Washington avenue, Elmira*	2,729 84	
For reconstructing lock No. 20 (final)	1,166 17	
For improvement of harbor at Watkins*	1,292 40	
For reconstructing locks 5, (8,) 13, 16, 17 and 18 (final)	5,568 75	
For swing bridge, 2d street, Elmira*	2,723 05	
For repairs of breaches caused by March freshet	33,012 30	
For raising three bridges and repairing dam at Corning*	514 60	
For new farm bridge at Gibson's*	400 20	
For part salary Canal Commissioner	75 00	
		$89,615 62

Superintendent's Expenditures.

For repairing and moving State dredge and supplies for same	$267 50	
For snubbing posts at locks No. 4 and 7	7 50	
For timber for lock gates	365 88	
For reconstructing lock No. 8	7,458 76	
For reconstructing lock No. 26	6,524 28	
For salary inspector	1,355 50	
For salary superintendent	999 98	
For miscellaneous	17 00	
		16,996 40

Miscellaneous Expenditures.

Elizabeth Bancroft, lands deeded to State for canal purposes	$200 00	
Dawson & Co., publishing notice to contractors	118 57	
Summers & Brother, publishing notice to contractors	37 95	
Wm. Carpenter, material for Carpenter's farm bridge	30 00	
Angeline Lockwood, material for Lockwood's road bridge	25 00	
D. E. Whitford, inspector	276 50	
Lt. F. Olney, inspector	237 00	
Alfred Lee, temporary occupation of lands and material taken for embankment while rebuilding locks	39 00	
James S. Locke, do	100 00	
William Crouch, do	30 00	
John Sailey, do	40 00	
Mathew Lewis, do	40 00	
J. W. Lee, do	70 00	
W. C. Gillespie, do	25 00	
Samuel Brink, do	170 00	
David Thomas, do	25 00	
E. S. Smith, do	25 00	
Edwin Mead, do	15 00	
O. M. Clauharty, inspector	702 00	
Jas. S. Locke, release farm bridge	540 97	
E. K. Mandeville, inspector,	96 00	
D. E. Whitford, miscellaneous expenditures	79 20	
H. P. Haskin, release farm bridge between locks Nos. 35 and 36	405 13	
Charles Cook, publishing notices	14 85	
Geo. W. Pratt, publishing notice	14 85	
B. F. Bruce, traveling expenses	100 00	
		3,457 02
Total expenditures on canal		$110,069 04

ONEIDA LAKE CANAL.

This canal connects the Erie canal with the waters of Oneida lake, furnishing thirty miles of lake navigation, intersecting the Oneida River improvement, which forms a junction with the Oswego canal at Three River point. The Oneida Lake canal, proper, is six miles in length, and extends from the Erie at Higginsville, to the head of Oneida lake. The structures are: 7 wooden lift-locks, 2 culverts, 1 towing-path bridge, 2 road bridges, 3 lock houses, 4 watch houses, 1 collector's office,

For paid on account of repair contract $2,375 00

CHENANGO CANAL.

This canal extends from the Erie canal at Utica to the Susquehanna river at Binghamton—97 miles. It comprises three repair sections, as follows:

Repair Section No. 1.

This section extends from the junction of the Chenango and Erie canals, in the city of Utica, to the foot of lock No. 81, one mile south of the village of Hamilton, 31 miles. The following reservoirs are located upon it: Madison brook, Woodman's pond, Leland's pond, Bradley's brook, Hatch's lake, Kingley's brook and Eaton's Brook, all of which are in the southern part of Madison county. Connected with the section are 13¾ miles of feeders. Total miles, canal and feeders, 44¾ miles. The structures are: 77 composite lift-locks, 4 stone lift-locks, 4 wooden trunk aqueducts, 1 stone arch culvert, 1 guard-lock, 12 arch culverts, 7 box culverts, 9 waste weirs, 3 iron bridges, 44 wood bridges, 30 bridges on feeders.

The expenditures upon this section during the fiscal year, were as follows (all marked thus * having been ordered by the Canal Board.)

Drafts on Auditor.

For repairs per contract	$21,334 74	
For rebuilding Kingsley Brook reservoir*	12,512 00	
For part salary Canal Commissioner	75 00	
		$33,921 74

Superintendent's Expenditures.

For services L. F. Olney, inspector	$770 50	
For services W. H. Webb, inspector	43 00	
For miscellaneous expenses	37 13	
For services of a rodman	9 00	
For salary superintendent	800 00	
		1,659 63

Miscellaneous Expenditures.

M. D. Raymond, publishing notice letting Kingsley Brook reservoir.	$106 64	
Berry & Kingsley, do do	106 64	
O. H. Bogardus, inspector	79 00	
		292 28
Total expenditures on section No. 1		$35,873 65

Repair Section No. 2.

This section extends from the foot of lock No. 81 to and including the first farm bridge above lock No. 100; distance 34 miles. The structures are: 18 composite lift locks, 18 wooden trunk aqueducts, 6 waste weirs, 9 bridges on feeders, 3 iron bridges, 60 wooden bridges, 13 arch culverts.

There are six feeders with an aggregate length of four miles, with dams to the length of 1,000 feet.

The expenditures upon this section during the fiscal year were as follows:

Drafts on Auditor.

For repairs per contract	$13,939 92	
For balance due on account of rebuilding lock No. 99	762 22	
For bridge at Sherburne on change of plan—difference in cost	870 06	
For repairs of breaches caused by freshet in March	19,237 00	
For part salary Canal Commissioner	75 00	
		$34,884 20

Superintendent's Expenditures.

For general repairs while not under contract	$196 47	
For inspector's services	586 87	
For salary Superintendent and clerk hire	468 75	
For miscellaneous expenditures	20 71	
		1,272 80

Miscellaneous Expenditures.

O. H. Bogardus, inspector	$79 00	
Jno. Crawford, publishing notice	17 32	
E. D. Van Slyck, publishing notice	14 17	
Comstock & Cassidy, publishing notice	37 95	
		148 44
Total expenditures on section No. 2		$36,305 44

Repair Section No. 3.

This section extends from the first bridge north of lock No. 100 to the junction of the canal with the Chenango and Susquehanna rivers, in the village of Binghamton—distance 32 miles. The Stratton and Chenango Forks feeders are located on this section, the Stratton being about fifty rods in length, with a dam three hundred and fifty feet in length, and having two bridges, one farm, the other towing-path. The Chenango Forks feeder consists of a dam three hundred and fifty feet in length, with a guard lock, having a towing-path bridge across it. The structures are: 1 stone lift lock, 14 composite lift locks, 1 guard lock, 2 dams, 7 waste weirs, 5 wooden trunk aqueducts, 3 iron bridges, 55 wooden bridges, 10 arch culverts, 1 bridge on feeder.

The expenditures upon this section during the fiscal year were as follows: (all marked thus * having been ordered by Canal Board.)

Drafts on Auditor.

For repairs per contract	$10,617 26	
For reconstructing lock No. 100	8,115 71	
For reconstructing lock No. 109	1,136 85	
For bridge on change of plan on Henry street, Binghamton,—increased cost	346 15	
For farm bridge ditto at Port Dickinson	70 00	
For farm bridge ditto near S. & B. railroad bridge	47 45	
For new bridge Port Dickinson*	966 24	
For repairs of breaches caused by freshet in March	29,670 50	
For paid award Canal Board made June 28 on account of reconstructing lock No. 100	6,279 03	
For ditto lock No. 104	3,919 98	
For ditto lock No. 109	3,101 27	
For part salary Canal Commissioner	75 00	
		$64,345 44

Superintendent's Expenditures.

For inspector's services	$586 87	
For rodman's services	6 00	
For salary superintendent and clerk hire	468 75	
For miscellaneous expenditures	18 58	
		1,080 20

Miscellaneous Expenditures.

O. H. Bogardus, inspector	$79 00	
James T. Norton, publishing notice	16 20	
		95 20
Total expenditures on section No. 3		$65,520 84

Recapitulation.

ERIE CANAL.	Sections.	Totals.
Total expenditures on section No. 7	$20,495 60	
Total expenditures on section No. 8	32,064 68	
Total expenditures on section No. 9	16,939 95	
		$69,500 23
OSWEGO CANAL.		
Total expenditures on section No. 1	$16,919 17	
Total expenditures on section No. 2	291,479 20	
		308,398 37
BALDWINSVILLE CANAL.		
Total expenditures		391 00
ONEIDA RIVER IMPROVEMENT.		
Total expenditures		1,187 90
CAYUGA AND SENECA CANAL.		
Total expenditures		17,686 90
CROOKED LAKE CANAL.		
Total expenditures		37,239 27
CHEMUNG CANAL.		
Total expenditures		110,069 04
ONEIDA LAKE CANAL.		
Total expenditures		2,375 00
CHENANGO CANAL.		
Totol expenditures on section No. 1	$35,873 65	
Total expenditures on section No. 2	36,305 44	
Total expenditures on section No. 3	65,520 84	
		137,699 93
Total		$684,547 64

IMPROVEMENT AT CORNING.

Drafts on Comptroller.

Paid contractor on account of improvement at Corning, under act, chapter 326, Laws of 1865	$23,341 00	
Paid inspector of the work	318 00	
		$23,659 00

CHENENGO CANAL EXTENSION.

Payments by draft on the Auditor have been made as follows:

On account of constructing section No. 1	$969 00	
On account of constructing section No. 5	2,348 00	
On account of constructing section No. 8	136 00	
On account of constructing section No. 9	680 00	
On account of constructing section No. 10	1,666 00	
On account of engineering, including expenses of survey	9,268 58	
		15,065 58

Miscellaneous Expenditures.

On account of advertising letting of sections and printing for letting	553 45
Total for fiscal year	$15,619 03

Statement showing, amounts paid on awards made by Canal Appraisers for land damages on account of the enlargement of the canals, for the fiscal year ending September 30, 1865.

Date.	TO WHOM PAID.	Account of what Canal.			
		Erie.	Oswego.	Cay. & Sen.	O. R. Imp.
Oct. 4..	Ansel Bascom, est. of			$4,000 60	
14..	Hiram Lay			1,500 00	
	Henry W. Danison			745 00	
	T. M. Smith, est. of			660 00	
	Henry Van Vleck		$645 00		
	Abram K. Squires			1,013 00	
Nov. 15..	George W. Rice				1,010 52
	Calvin Y. Shepard				527 20
	John Young				1,152 00
	Lyman Barber				326 40
	T. N. & M. B. Jarvis, and M. B. Jarvis, administrator Sam'l Jarvis, dec'd	563 03			
16..	J. Worden, est. of	2,000 00			
Dec. 1..	Jacob Horning	300 00			
9..	Chas H. Weed, assignee of Thomas Smith	900 00			
16..	Martha Down				307 20
Jan. 5..	Baldwin estate*				
11..	Sinclair Tousey				300 00
	Ira Northrup				1,000 00
	John G. Evans	1,300 00			
12..	Hosea Case		151 31		
	James Keith		380 55		
Feb. 14..	A., J. A., & D. T. Coon	5,295 00			
	J. A. Coon	800 00			
	J. I. Walrath	3,000 00			
	William A. Swift	2,599 60			
15..	Nancy Betts, administratrix of G. C. Ferris, dec'd	100 00			
Mar. 25..	William Hyland	1,000 00			
29..	Samuel Lay, 2d			600 00	
	Morgan Lewis	225 00			
April 1..	S. P. Cunningham†				
11..	Louisa W. Weed, sole executrix Elisha Weed, dec'd	1,297 00			
	Alanson G. Coon	2,000 00			
	Burton J. Reed	1,752 00			
	Sarah G. Shaw	50 00			
May 1..	Sarah M. Howes	2,100 00			
8..	Eleazer Swetland	3,835 50			
15..	Thomas Collinson		74 50		
	Peter Rease ‡				
16..	B. C. Lathrop	3,000 00			
19..	William De Mont			400 00	
	Solomon Savage			300 00	
20..	D. D. McCoon		59 60		
23..	Julia A. Whitney		500 00		
June 2..	Harriet E. Colvin, execut'x	4,750 00			
6..	Britton Allen	2,888 20			
	L. T. & H. L. Hawley, and M. L. Waldron		10,800 00		
8..	A. Althouse		727 00		
	J. W. Pratt		521 50		

Payments on awards made by Canal Appraisers—Continued.

Date.	TO WHOM PAID.	Account of what Canal.			
		Erie.	Oswego.	Cay. & Sen.	O. R. Imp.
June 8..	Norman Vaugh		$1,024 00		
14..	Samuel C. Smith§				
	Bradley Merchant, est. of.	$712 88			
15..	John Van Buren		1,304 46		
	Hymen Evarts		298 00		
	Volkert Van Buren		1,295 95		
	P. H. & Thomas Howe			$4,000 00	
	George W. Allaman			100 00	
	James Teal			539 60	
	R. Hunt			50 00	
	Margaret W. Burrall			125 00	
	S. Van Demark			1,130 00	
	E. Gay & John N. Chandler			1,028 50	
	Edmund Gay			1,420 00	
17..	James Whitaker		372 50		
20..	E. Cady Stanton			400 00	
	H. B. Stanton, attorney for executors of Daniel Cady, deceased	720 00			
	Adeline Teal, executrix of Ansel Teal, deceased			695 00	
	B. Skaats, executor D. S. Skaats, deceased			3,000 00	
23..	Jacob Shoemaker			575 00	
27..	Daniel Mullett‖				
	John & James Rogan			200 00	
29..	John Morse			3,089 34	
July 1..	Mary J. Briggs		257 70		
3..	E. F. Wallace		1,148 00		
	James Lynch		234 00		
10..	W. A. Dorsey			250 00	
	George Bennett			202 50	
	John Alabaster			114 25	
	Peter R. Bonnet			125 00	
11..	Stephen Pendergast, exec'r Michael Pendergast, dec.		4,075 00		
	John Shanahan		2,925 00		
	Richard B. Claxton		400 00		
	Elizur Clark		2,980 00		
15..	Jerome J. Briggs		6,885 00		
20..	James M. Stevenson and Betsey Bidwell			951 40	
	William Ross			350 00	
	F. David & D. D. McKoon		74 50		
	James Jenny			497 00	
	John Sthalnecker, admin'r of Jacob Sthalnecker, dec.			125 00	
	Norman Springstead			125 00	
	Asa Phillips		1,500 00		
	David S. Taber		149 00		
	Charles S. & Julia A. Sweet		188 72		
Aug. 1..	Joseph Gilbert		74 32		
	Darrow & Peter Lay	750 00			
	Timothy Pratt		894 00		
	John S. Pratt			150 00	
3..	Philip Martin			1,029 50	
	D. S. Bunnell, ad'st John Shoemaker, dec'd; Edwin Mynders & Geo. B. Daniels by Benson Owen, att'y			5,062 50	
4..	John W. Clauhry & Gilson D. Carrier			303 21	
	Joseph Vickery			543 51	
15..	J. D. Ledyard		745 00		

Payments on awards made by Canal Appraisers—Continued.

Date.	TO WHOM PAID.	Account of what Canal.			
		Erie.	Oswego.	Cay. & Sen.	O. R. Imp.
Aug. 14..	Nathan Lewis	$375 00			
Sept. 21..	Edmund Murray		$372 50		
	Samuel Scott		74 50		
26..	Mary M. Thomas			$200 00	
	Park Spicer	65 00			
	Robert J. Swan			300 00	
	C. W. Barnes	110 00			
	Albert G. Burdick	550 00			
	Amasa Parker, est. of		186 25		
	Horace P. Eno and Rufus Diefendorf		149 00		
	Totals	$43,038 21	$41,566 86	$35,899 31	$4,623 32

* Account of Seneca River improvement, $1,031.83. † Account of Chemung canal, $6,206.
‡ Account of Chemung canal, $163.33. § Account of Chemung canal, $2,000.
‖ Account of Chemung canal, $500.

Recapitulation.

Erie canal	$43,038 21
Oswego canal	41,566 86
Cayuga and Seneca canal	35,899 31
Oneida River improvement	4,623 32
Seneca River improvement	1,031 83
Chemung canal	8,869 33
Total	$135,029 86

Certificate for interest.

To Alanson Dodge by Thomas Gale, attorney, under chap. 734, Laws of 1857	$870 40

Summary.

Total amount expended for repairs	$311,124 75
Total amount expended for repairs of damages caused by freshet in March	276,552 42
Total amount expended under special laws	96,870 48
Total	$684,547 65
Total expended from general fund by draft on the Comptroller, for the improvement at Corning, under act, chap. 326, Laws of 1865	$23,659 00
Total expended on account of the extension of the Chenango canal	$15,619 03
Total amount drafts for land damages on awards of Canal Appraisers	$135,029 86
Total amount interest paid under chap. 734, Laws of 1857	$870 40

WESTERN DIVISION.

The Commissioner in charge of the Western Division respectfully presents the following report, for the year ending September 30, 1865.

The Western Division of the canals consists of that part of the Erie canal from the east line of Wayne county to and including the canal and canal basins and slips in the city of Buffalo, together with the Genesee Valley canal.

This division of the canals for superintendence and repairs is divided into eight repair sections, five being upon the Erie and three upon the Genesee Valley canal. Those upon the Erie canal are sections Nos. 10, 11, 12, 13 and 14, and those on the Genesee Valley canal are Nos. 1, 2 and 3.

Sections 10 and 11 of the Erie canal were in charge of C. B. Strong last season, and he is the present superintendent.

Sections 12, 13 and 14 remain in charge of Chester F. Shelly.

Sections 1 and 2 Genesee Valley canal were in charge of F. X. Beckwith until the 1st of February last; since then section 1 has been in charge of John L. Burleigh, and section 2 in charge of Ebenezer Kingsley.

Section 3 was last year in charge of William Napier, now in charge of Hiram Wakeley.

The engineer department is in charge of Orville W. Story, division engineer, and W. W. Jerome, resident engineer.

ERIE CANAL.

Repair Section No. 10.

This section is forty-two miles long, and is embraced within the limits of Wayne county. This section is under contract to be kept in repair by Chester B. Thomas, at the rate of $19,375.20 per annum until the 1st of January, 1867.

The addition made to this contract, by the Contracting Board, under chapter 252 Laws of 1864, is $27,806.85, being at the rate of $7,415.20 per annum.

The following are the mechanical structures on the section: 23 timber road bridges; 11 iron road bridges; 9 timber farm bridges; 3 waste weirs; 3 composite culverts; 19 stone culverts; 1 discharge culvert; 10 stone locks—of which 8 are single; 2 aqueducts; 4 lock houses; 9 watch houses; 1 workshop and shed.

No new structures have been added the past year.

The sewer commenced in the village of Clyde during the summer of 1863 has not been completed.

This work was authorized and directed by chapter 35 Laws of 1862. Its object was to drain a pond of stagnant water near the village which was created by the construction of the canal.

The Canal Board, under the provisions of relief act chapter 684 Laws of 1865, made an award to the contractor and canceled the contract.

The undersigned opposed this action of the Canal Board, believing that the State is under obligations to protect the health of its citizens, especially when endangered by State action, and he deemed it unwise to suspend the work when a large portion of the sewer had been completed. This work is termed an extraordinary repair, and there are no funds to pay the award to the contractor or for its completion. The cost, with the award made to the contractor, is $8,737.33, of which amount $2,929.28 is due to the contractor and remains unpaid. To complete the sewer will require six thousand dollars.

The sewer in Newark has been completed at an expense of $9,455.98.

This work was done as an extraordinary repair under directions from the Legislature.

The bank near Pit lock was considered unsafe, and has been raised and widened. A part of the cost remains unpaid, and as it is classed as an extraordinary repair, will require an appropriation especially therefor; the balance due is $1,798.74.

There has been no serious detention to navigation upon this section since last report.

The expenditure on account of repairs during the fiscal year has been as follows:

To paid repair contractor his annual compensation	$17,051 97
To paid same under relief act, chapter 252, Laws 1864	9,269 00
To paid same for additional security to mitre sills, improvements in lock gates, making sluices, &c., certified under terms of contract by Division Engineer	2,598 38

Payments made by superintendents:

To paid for assisting crowds of boats	47 00
To paid for labor and material on Macedon lock, in which new lock gate is being tested	242 17
To one-half superintendent's salary, clerk hire, advertising, postage, &c	580 86
Total expenditure	$29,699 38

Repair Section No. 11.

This section is thirty-eight miles long, and extends from the east line of Monroe county to the west line of construction section No. 284, in the village of Brockport.

This section is under contract to be kept in repair by Byron M. Hanks, to whom it was let for four and one-sixth years from the 1st day of November, 1862, at $11,900 per year. The addition made to the same by the contracting board increased the compensation to the sum of $19,040 per year.

The following mechanical structures are upon this section: 6 lift-locks, 1 guard-lock, 1 weigh-lock, 2 stop gates, 1 aqueduct, 6 waste weirs, 41 culverts, 2 wooden farm bridges, 13 wooden road bridges, 23 iron road bridges, 3 wooden tow-path bridges, 1 iron tow-path bridge, 4 lock houses, 1 work shop, 5 watch houses, 1 dam.

In obedience to the provisions of chapter 473, Laws of 1863, the undersigned caused an iron road bridge to be constructed over the Erie canal, on Griffith street, in the city of Rochester. The work was let to Benjamin McFarlin, he being the lowest legal bidder. The cost of the structure, aside from engineering, was $8,490.13, and the same was paid from the repair fund allotted to the Western Division.

The tow-path bank, near the four-mile grocery, west of Rochester, has been considered dangerous and unsafe; it was partially secured last spring by widening the canal on the berm side, and to a corresponding extent increasing the width of the tow-path bank. The work was done by the contractor and paid upon the certificate of the engineers by the superintendent; cost $3,292.06.

A waste weir has been built in the outlet of the old aqueduct, in Rochester, at a cost of $783.82. The work was done by the contractor under the supervision and direction of the Engineer Department. It is a very necessary and valuable improvement.

The protecting and sustaining bank of the tow-path bridge at Rochester, with the bridge approaches, required reconstruction; the wall from the bank of the river was built upon a defective plan and had been failing for several years. It was necessary to reconstruct the work, and it was done by the contractor, under direction of the Engineer Department, at an expense of $5,326.44 to the State, and to the contractor of $644.05.

This section of the canal was seriously damaged by the great flood of March last, and was repaired and placed in its former condition as rapidly as possible.

There was a very large break in the tow-path bank of the Oxbow basin on the 25th of November, 1864. This was one of the largest and heaviest breaks in the history of our canals, and in its failure carried out a larger quantity of material than is on record of any single disaster of that character. The repairs required a large number of men and teams, who were employed during the entire winter and spring.

The undersigned gave his draft to the repair contractor for $26,000, being the amount due to him under the terms of his contract. He has been since paid the sum of $20,000, and there is still due him $31,973.36.

The two last sums, amounting to $51,973.36, are the result of a relief act, which virtually directed the Canal Board to pay that exact sum, it being the actual cost of the entire repair as proven before the Board. See chapter 490, Laws of 1865.

The cost of operating this section has been as follows, including awards of Canal Board:

To paid repair contractor his annual compensation	$18,234 70
To paid same under relief act, chapter 252, Laws 1864	8,925 00
To paid for repairs on weigh-lock, aside from contract	2,350 70
To paid for reconstructing in a more secure and substantial manner the protection wall and approaches to tow-path bridge near weigh-lock	5,326 44
To paid for raising and graveling tow-path	1,317 50
To paid under contract for repair of Oxbow break	26,000 00
To paid for repairs of Oxbow break under chapter 490, Laws 1865	20,000 00

Payments made by Superintendent:

To paid Lewis Selye for constructing waste weir in old aqueduct, Rochester	847 32
To paid same for improving and securing tow-path bank near four-mile grocery	3,292 06
To paid balance on tile drain at Adams' basin	23 49
To one-half of superintendent's salary, clerk hire, telegraphing, postage, &c.	580 86
Total	$86,898 16

Griffith street bridge was paid from the repair fund, but it was an entire new structure and in no way connected with the repairs of the canal; it was built by direction of the Legislature. Payments have been made on that account to the amount of $8,562.59.

Repair Section No. 12.

This section is thirty miles long, and extends from the west end of construction section No. 284 (in Brockport) to the west line of the county of Orleans. It is now under contract for repairs to Edward A. Mills, for four and three-fourths years, from April 1, 1862. The original contract price was $6,700. The Contracting Board added thereto $3,417 per annum, making the annual compensation $10,117 from the 1st of April, 1863.

The following are the mechanical structures upon the section:

Seven waste weirs; forty-three culverts; twenty wood road bridges; eleven iron road bridges; three wood farm bridges; one aqueduct; one bulkhead for Medina feeder; one dam for same feeder.

The culverts upon this section have nearly all been reconstructed or thoroughly repaired.

The excavation of the channel of Oak Orchard creek, directed by chapter 335, Laws of 1863, has not been completed, but it is believed that it will be before another season. This work has proved of much greater magnitude than was anticipated at the outset, and the difficulty of obtaining labor has caused the work to be delayed.

An appropriation of $19,000 will be necessary to secure the completion of this work, and to pay the amount due the contractor.

I earnestly opposed this measure in its inception, but now, after so large an expenditure has been made, it seems proper that it should be completed, as the object of the measure will not be accomplished until the work is finished.

A sewer, in the village of Albion, directed to be built by chapter sixty-nine, Laws of [illegible], has been completed. The work was let by contract to [illegible] bidder, and cost, exclusive of engineering and sup[illegible]1.60. A sluice in Holley has been constructed [illegible]9.

The cost of maintaining this section for the year has been as follows:

To paid repair contractor, his annual compensation		$8,850 69
do do	under relief act, chap. 252, Laws of 1864	4,271 25
do do	for strengthening and securing banks	741 90
do do	for securing Fish Creek culvert	777 05
do for materials and temporary occupation		200 00

Paid by superintendent:

For bank watchers	654 00
sluice in Holley	212 52
To one-third of superintendent's and clerks' salary	477 33
	$16,184 74

Repair Section No. 13.

This repair section is twenty-six miles long, and extends from the west line of Niagara county to Pickard's bridge, over the Tonawanda creek.

This section was let to N. S. Osborn, for three years and three months, from the first day of October, 1864, at the rate of fourteen thousand four hundred dollars per year.

The following are the structures upon the section:

Twenty-one culverts, two State races, four waste weirs, ten combined stone lift locks, one stone guard lock, seventeen wood road bridges, thirteen iron road bridges, two wood farm bridges, one iron tow-path bridge, four wood tow-path bridges, one stop gate.

The bridge known as the New Home bridge, over Tonawanda creek, has been completed. There has been paid to contractor $14,994.50. Pickard's bridge, over the same creek, has been reconstructed, at a cost on contract of $6,476.60.

Both those bridges were directed to be built by the Legislature, and the expense of the same has been paid from the extraordinary repair fund. The former bridge is a new structure. The latter was originally built by the counties of Erie and Niagara, and having fallen down, was reconstructed, and is to be maintained as a State bridge.

The section, for the months of August and September, 1864, was in charge of the superintendent, whose accounts were rendered in October, and therefore appear as part of the expendi-

ture of the present fiscal year. The contractor had abandoned the section by permission of the contracting board, under the provision of chapter 252, Laws of 1864.

The payment on account of this section the past year has been as follows:

To paid contractors,	their annual compensation	$14,282	49
do	do under relief act, chap. 252, Laws of 1864	9,146	60
do	do for deficiency in tools, advertised in letting schedule, paid for to State by him	105	37
do	do securing and re-building waste gates	123	95
do	do securing Sulphur Spring guard lock	612	76
do	do securing banks and improvements in lock gates	866	66
do	for advertising section	79	99
do	Truman Kilbourn, for commutation of farm bridge	1,200	00
do	Francis Hitchins, for same	800	00

Payments made by superintendent:

To paid	for repairs on locks	1,210	25
do	for lock tending	2,052	74
do	for repairs, bridges	917	20
do	for reconstructing abutment New Home bridge	735	93
do	for bank watching	195	85
do	for repairs State scows	376	44
do	for use of dredge	792	00
do	for building horse pass	102	37
do	repairing tow-path and docking	573	91
do	sundries	26	64
do	one-third superintendent's and clerks' salary	477	33
Total		$34,178	54

Repair Section No. 14.

This section is seventeen miles long, and extends from Pickard's bridge across the Tonawanda creek, to and including the slips and basins in the city of Buffalo.

The section is now under contract with Andrew Spalding, to be kept in repair three years and three months from the first of October, 1864, at the annual compensation of $24,970.

The following structures are upon this section:

Forty-seven road bridges, fifty-five farm bridges, three culverts, two locks, one ship lock, two foot bridges, one stone pier at Black Rock harbor, one protection pier, or break-water, for Erie basin, one jetty pier in Erie basin, and one tow-path bridge.

The Clark and Skinner canal has been completed, as far as the contract provided, which was to dock one side of the canal and excavate the channel to canal bottom forty-two feet wide. The funds for the payment of this work were taken from the extra-

ordinary repair fund, and no more could be spared at that time. The slip should now be completed by excavating the remaining sixteen feet and docking the south side. Engineer Story estimates the expense at fifteen thousand dollars.

The appropriation for the work was $16,500, all of which has been exhausted, and there is due the contractor the further sum of $5,417.65. This balance became due after he was notified that the fund was exhausted, but he preferred to complete the contract. I respectfully advise that provision be made for the payment of the same.

Some work has been done towards making the channel in the Erie basin three hundred feet wide, as originally contemplated, but the amount of money subject to the control of the Canal Board (for extraordinary repairs) was so small that but little could be accomplished—at least ten thousand dollars should be used for that purpose the coming season of navigation.

Scajaquadays creek empties into the canal and Black Rock harbor; is of sufficient capacity to be used by lake craft; to permit their passage float bridges were used; they often became disconnected, were ran into and sunk, and were cumbrous and difficult to move, frequently creating delays to canal boats; to obviate this difficulty a draw bridge has been constructed, which has proved to be a valuable improvement to navigation at that point. The bridge cost $3,531.98, which was paid from the extraordinary repair fund.

This section suffered severe damages by the flood of March 17th, especially in the village of Tonawanda, the vertical wall was taken out from both sides of the canal, through the village, with two iron bridges and three of their abutments; one of the bridges was totally destroyed; the other has been reconstructed. Above the village the banks were carried away about two hundred feet in length, and in places to a depth of twenty-four feet below canal level. The repairs were placed in the hands of the superintendent and engineers, and with great exertions were sufficiently advanced to afford navigation on the 1st of May.

The repairs are not yet completed. To prevent, as far as may be possible, a like disaster, a spillway, connecting with the Niagara river, has been built, which will pass, in flood-time, four hundred and fifty-two thousand cubic feet of water per minute, without overflowing canal banks. The construction of another is contem-

plated, which it is believed will materially aid to prevent damages in that locality.

This section was in charge of Superintendent Shelly during the months of August and September. The contractor having been released by the contracting board, the expenses of those months could not be accounted for before October, and became a part of the expenses of the present fiscal year.

Cost of the section for the past year has been as follows:

To paid repair contractors, their annual compensation			$19,455 81
do	do	under relief act, chapter 252, Laws 1864	13,440 00
do	do	for repair breaks of March 17, 1865	4,261 39
do	do	for reconstruction, Lloyd and Scott street bridges in Buffalo	903 69
do	do	for dredging below ship lock	598 20
do	do	for deficiency in tools, purchased of State by contractor	649 74
do	do	for additional protection to Tonawanda dam,	447 35
do	do	for improvements in gates of do do	383 29
do	do	for various improvements, certified by engineer	1,151 12
do	do	for temporary damages and occupation of lands	150 00
do	do	for advertising, &c.	82 98
To paid Williams & Swarts, on account rebuilding Louisiana street bridge, Buffalo			2,230 00

Payments by superintendent:

Paid for	reconstruction Lloyd street bridge abutments	1,796 45
do	boat inspectors	1,724 [illegible]
do	lock tending	925 53
do	dredging and repairs and expenses of State dredge	2,395 84
do	repairs of Scajaquaday creek dam and State ditch	810 77
do	repairs of bridges	3,727 37
do	repairs of Black Rock pier	1,083 67
do	dredging channel in Erie basin	1,527 00
do	repairs of tow path and of State scows	3,051 73
do	repairs of ship and guard lock	261 52
do	towing dump boats and other boats during break	1,066 00
do	repairs of break in dam at Tonawanda, fall 1864	1,392 36
do	expenses of raising boats	177 50
do	protection fence tow path, Buffalo	523 11
do	repairs Ohio basin slip	325 00
do	snubbing posts and setting same	139 49
do	watching dams and swing bridge	146 93
do	sundries	116 87
Paid on account repairs of breaks at Tonawanda, occasioned by flood of March 17, 1865		43,410 63
To one-third of superintendent and clerk's salary		473 34
Total		$108,828 68

GENESEE VALLEY CANAL.

This canal extends from the Erie canal, in the city of Rochester, to the Allegany river, at Milgrove, 113 miles. The Dansville side cut commences at the Shaker aqueduct, near Mount Morris, and extends to Dansville, a distance of eleven miles.

Repair Section No. 1.

This section is fifty-two miles long, and extends from the junction of the Genesee Valley canal with the Erie canal at Rochester to the terminus of the Dansville side-cut at Dansville. It was let for three and one-quarter years, from the first day of October, 1864, to Wm. W. Reed, at the rate of nineteen thousand four hundred dollars per year.

The mechanical structures upon this section are as follows:

Nineteen lift locks, three guard locks, four dams, three bulkheads, eight aqueducts, fifty-seven culverts, fifteen waste wiers, forty-five road bridges, sixty-two farm bridges, three tow-path bridges, and eleven lock houses.

The expenditures upon this section for repairs of the breaks and other disasters, occasioned by the flood of August 17, 1864, were very large; yet not near so great as the flood of March 17, 1865.

The canal in the vicinity of Rochester was nearly obliterated, and, notwithstanding all possible exertions, could not be brought into service untill the 20th of May.

A large amount of repairs have been made upon this section, which is fully stated in the report of the division engineer which accompanies this report and which explains more in detail than this paper.

The greater part of the repairs, occasioned by floods in 1864, were repaired in August and September of that year; but the expenditures for those months were not rendered until October, and form a part of the expenditures of the fiscal year ending this date.

The expenditures, chargeable to repair fund for fiscal year, have been as below noted:

To paid repair contractors, their annual compensation			$15,115 76
do	do	under relief act, chapter 252, Laws 1864	6,777 60
do	do	for repairs of breaks of March 17, 1865	64,540 00
do	do	for repairs of breaks of August, 1863, under chapter 302, Laws of 1864, award of Canal Board	19,266 43
do	do	for reconstructing waste wiers on York level at Piffardinia and near Keyserville	2,685 53
do	do	for reconstructing culvert wings and protecting culverts	1,429 16
do	do	for securing Shaker and Buck run aqueducts and strengthening bank near Shaker aqueduct	1,532 94
do	do	for temporary occupation of lands	24 85
To miscellaneous payments			20 50

Payments by superintendents:

For lock tending	705 85
For incidental repairs of locks	638 02
For repairs of bridge	1,116 40

For repairs of banks, aqueducts, culverts, waste wiers, dams, and cleaning deposits from canal, occasioned by flood of August, 1864...	15,035 17
For repairs of State scows	335 97
For watching banks, &c.	62 87
For repairs of tools	97 87
For miscellaneous payments	70 90
For cutting grass in canal	49 62
For superintendent and clerk's salary, telegraphing, &c.	1,014 95
Total	$130,520 39

Repair Section No. 2.

This repair section is thirty-six miles long, and extends from the junction of the canal with the Dansville side-cut, at the Shakers settlement, to and including the Genesee River feeder at Oramel.

The mechanical structures upon this section are the following:

Sixty-one lift locks, one guard lock, one dam and bulkhead, seven aqueducts, thirty culverts, nine waste wiers, thirty-five road bridges, twenty-eight farm bridges, four tow-path bridges.

This section was so seriously damaged by the flood of August, 1864, that it could not be re-let until repaired. Many of the locks, waste weirs and other structures, required extensive repairs, and a large portion of the aqueduct at Caneadea was destroyed.

The section was placed under contract with Samuel Price, to take effect on this date. The annual payment is to be seventeen thousand dollars, and the contract continues for three and one-fourth years.

Five locks, to be built of stone, are under contract, and will be completed in season for the opening of navigation in 1866.

Large expenditures were necessary and have been made upon the wooden locks upon the section, as they were in a dilapidated condition. The re-building of the locks are exempted from the repair contract, and several would have been put under contract for the coming winter, had not the undersigned considered it poor economy to re-build locks of wood, and hoped, by representing their condition to the Legislature, that it would make a specific appropriation for building at least three locks of stone, instead of wood. The expense is estimated at $40,000.

The re-building of the wooden trunks at Portage has also been exempted from the contract, as, in the opinion of the Commis-

sioner and engineers, they should be made of earth when reconstructed. One of them is unsafe, and during the past season some work has been done towards making an earth canal. The expenditure thus far has been $4,463.82. Twelve thousand dollars will be required to complete it.

Payments, chargeable to repairs for the fiscal year, have been as follows:

To paid repair contractor, under relief act, 1864, additional compensation		$10,345 50
do	do balance of award made by Canal Board for repairs of breach of 1863	12,600 00
do	do for tools used upon section, upon expiration of his contract	2,562 00
do	do for advertising and temporary occupation of land	139 99

Payments made by superintendent:

Paid for	repairs of break of 1864, repairs of banks and excavating material washed in canal	21,496 28
Paid for	repairs of Caneadea aqueduct, carried away in 1864	18,042 28
do	repairs of locks, &c., many damaged by same flood	12,010 93
do	repairs of waste weirs, do do do	4,424 54
do	strengthening and protecting weak banks	2,607 43
do	repairs on Wiscoy, Cashequa and other aqueducts	2,250 35
do	repairs of brjdges and approaches	2,434 37
do	repairs of culverts	527 18
do	watching canal banks and structures	665 00
do	for locks $442.24; for new scow and furniture, $1,159.29	1,601 53
do	lock tenders	5,342 02
do	cleaning out canal, spring repairs	3,738 50
do	repairs of State scows	426 16
do	repairs of canal and structures, flood of 1865	1,799 22
do	cleaning channel of Caneadea creek, filled by same flood	793 18
do	on account reconstructing Portage trunk aqueduct	4,463 82
do	miscellaneous payments	196 95
do	superintendent's, clerk's salary, &c	816 65
		$109,283 88
Received for tools transferred to contractor		2,625 25
Total		$106,658 63

Repair Section No. 3.

This section is thirty-eight miles long, and extends from the south bank of the Genesee river, at Oramel, below and including lock No. 72, to the Allegany river at Milgrove pond.

The following mechanical structures are upon the section:

Thirty-four locks, one guard lock, four aqueducts, fifteen waste weirs, twenty-three culverts, thirty-seven road bridges, fourteen farm bridges, one tow-path bridge, two road and change bridges,

one foot bridge, five lock houses, one over-fall, at Rockville reservoir, and two feeder dams.

This section was under contract to be kept in repair by Messrs. Luckey & Martin, assignees of Wm. McArthur, whose contract expired on the 1st of August. The section has since been re-let to N. Stanton Gere, for three and a quarter years, commencing this date, at the rate of $9,990 per year.

This section has been in charge of the superintendent since the first of August last, during which time considerable damage was done by flood, nearly all of which was repaired before the section was taken possession of by the new contractor.

This section has not been very seriously damaged by floods the past three years, and that exemption permits a fair statement of what ordinary repairs might be on other sections if severe freshets were not so frequent upon them.

Payments upon the section have been as follows:

To paid repair contractor, his annual compensation		$9,795 71
do do	under relief act, 1864	4,645 62
do do	for widening and protecting Ischua dam, damaged by flood	1,884 28
do do	for securing and reconstructing apron of Dodge's Creek waste weir	936 40
do do	for protecting and securing banks and making spillways	1,338 90
do do	for reconstructing waste weir	180 69
do for temporary occupation lands		50 00

Payments by superintendents:

For advertising	1 00
salary	800 00
	$19,632 60
Received for sale of wooden tenement	198 25
Total	$19,434 35

Expenses General Management.

Commissioners' salary and travel	$2,400 00
Clerk hire, office rent and contingent expenses of office in Buffalo	2,461 61
Salary of clerk of contracting board, Canal Commissioners, and contingent expenses of the Albany office	1,777 88
	$6,639 49

Engineering.

On account repairs, Erie canal	$5,902 00
do do Genesee Valley canal	1,460 00
	$6,362 00

Enlargement Erie Canal—Land Damages.

Drafts for awards made by Appraisers and Canal Board	$48,635 61
Certificates in payment of same	60,527 64
To sundry persons for temporary occupation	405 00
To making final maps	131 00
	$109,699 25

Of the above, $26,580 was for the payment of damages done to lands and property by a break in the canal near Rochester, awarded by the Canal Board under direction of chapter 314, Laws of 1864.

Construction of Genesee Valley.

Drafts in payment of awards made by Appraisers and Canal Board	$18,488 20
Certificates in payment of same	5,705 00
	$24,193 20

Extraordinary Repairs.

The Legislature, during the sessions of 1863 and 1864, made appropriations for such works as the Canal Board should consider to be extraordinary repairs, to the amount of $828,309.68. Of this amount, $341,103.22 were assigned to the Western Division of the canals.

Payments for various works of this character had been made prior to the 1st of October, 1864, to the amount of	$193,541 85

Payments have been made since that date, on same account, as follows:

On account of completing sections 361, 362, 364, 365 and 366	51,244 00
do do bridge at York landing	543 75
do do military road bridge at Tonawanda	33 30
do do Clark & Skinner canal	15,589 00
do do sewer in Clyde	646 00
do do sewer in Newark	8,176 02
do do New Home bridge	15,354 30
do do Pickard's bridge	7,021 60
do do sewer at Albion	1,191 00
do do Hamilton Street bridge, Buffalo	336 38
do do Elk do do	1,077 02
do do Scajaquaday's creek tow-path bridge, new structure	3,531 98
do do Oil Creek reservoir	3,702 22
do do widening, securing and protecting banks	8,749 95
do do sluice at Holley	221 17
do do repairing culverts	5,320 51
do do dredging Erie basin, Buffalo	1,298 00
do do Ischua Creek dam	235 00
do do lock houses	465 00
do do temporary occupation of lands	832 50
do do Oak Orchard creek	9,853 00
do do of printing and advertising	481 55
do do inspection and engineering	6,258 63
Total	$335,703 73

Locks of Stone, Genesee Valley Canal.

There has been expended, of the fund raised under chap. 170, Laws of 1864, as follows:

On account of five locks, under contract	$6,596 36
do do surveys for Lime Lake reservoir	577 00
	$7,173 36

This fund amounts to $91,136.24. The balance unused should be re-appropriated at the next session of the Legislature, or it will revert to the General Fund.

Summary of Payments.

Payments for repairs, section 10, Erie canal		$29,699 38
do do do 11, do		86,898 16
do do do 12, do		16,184 74
do do do 13, do		34,178 54
do do do 14, do		108,598 68
do for engineering, Erie canal		5,902 00
Total, Erie canal		$281,461 50
Payments for repairs, section 1, Genesee Valley canal	$130,520 39	
do do do 2, do do	106,658 63	
do do do 3, do do	19,434 35	
do for engineering, Genesee Valley canal	1,460 00	
Total Genesee Valley canal		$258,073 37
Payment on account general management		6,639 49
Total payment on account repair and management Erie and Genesee Valley canals		$546,174 36
Payments on account enlargement Erie canal		83,249 25
do awards by Canal Board, break near Rochester		26,450 00
do account construction Genesee Valley canal		24,193 20
do do extraordinary repairs		142,161 88
do do Stone locks and Lime Lake reservoir		7,173 36
do do Griffith-street bridge, Rochester		8,562 59
Total payments on all accounts		$837,964 64

Expenditures—Repairs.

The cost of maintaining and operating the canal of the western division has been unprecedentedly large, and it seems eminently proper that the causes thereof should be examined and clearly stated. The Commissioner should be held responsible for *his management* of the canals entrusted to his charge; and the magnitude of the interest involved demands that he should be prompt, faithful and energetic, and exercise prudence and economy in his expenditures; but it is not just to simply glance at the gross amount of payments and charge him with creating them.

For want of a settled system in operating our canals, both practically and financially, grave difficulties are encountered, and at present they are almost insurmountable.

To protect the vast interests, centering in the canals of the State, active, intelligent and able agents are absolutely necessary, who should be appointed and controlled by the Commissioner in charge.

The appointment of superintendents is vested in the Canal Board; that of engineers in the State Engineer and Surveyor with the concurrence of the Canal Board.

Superintendents under statutory provision can receive but one thousand dollars per year, which includes all their traveling and contingent expenses; as they have large responsibilities, both in managing works and disbursing moneys, frequently to the extent of a hundred thousand dollars per year, they should be of that character just described. That they are *not always such* is not surprising.

This policy is opposed to sound principles of political economy, is seriously detrimental to the interests of the State, and should be changed without delay.

In many instances the engineers in service are not of the Commissioner's selection, which should be the case, as they are now mostly employed on repair works which are ordered by him and are under his direction.

The agents for repairing and keeping up navigation, commonly known as repair contractors, are chosen by lottery—the lowest bidder being the winner of the prize. The Commissioners have no voice or control in this most important matter.

The writer has in former reports urged the necessity for a radical change in this system, but, as his statements have had no influence, he will but briefly entertain this subject.

Is it not a strange antagonism which employs agents to exercise watchful care and protection to property, when the greater the neglect to do so proportionately increases their salaries.

Breaks to him have no terrors; he needs no bank watchers; they are expensive; if an accident occurs he remedies the disaster, and, on presenting his bill to the Legislature, receives his pay.

Contracts become mere waste paper with him; and if an indignant Commissioner enforces the penalty of the same, the Legislature remits it.

There should be indefatigable and active exertions in maintaining navigation in its season, as the detentions and delays to boats and cargoes by cheap and inefficient management occasion great embarrasment and losses to commercial men. Such delay increases distrust in canal navigation, and has lost the State much revenue by the diversion of property to railroads. In this respect the apparent saving in the repair contract system in its commencement was overbalanced and became a heavy tax on those doing business on the canal. It now has no merits. The repairs under it have

reached a greater amount than under the superintendent system. It should be abolished.

To furnish superintendents with money for paying for works done or to be done by them under the Commissioner's direction, an estimate is made of the actual or anticipated cost, which, when approved by the Commissioner, is sent to the Auditor, who has assumed the right to furnish or withhold moneys to the superintendents, after striking out items or wholly rejecting the estimates.

Again, the Commissioner has work done under engineer direction, and gives his drafts upon the Department when the accounts are presented. The drafts frequently are protested by the Auditor refusing payment, thus controling the Commissioner's action, and subordinating the acting practical agent to the financial agent.

No doubt the Auditor is frequently embarrassed by the action of the Commissioners—who seldom agree among themselves—upon the mode of management. One Commissioner may do his work by the repair contractor—another by his superintendents, or through the engineer department, or even through all of those agencies. Yet this unfortunate condition of affairs affords no justification for the Auditor to assume which one is correct. It is not intended to charge the Auditor with a desire to embarrass the action of the Commissioners, but is presented as one of the many difficulties arising from want of systematic action.

The Commissioners should have the confidence of the Legislature, and their recommendations should have very careful consideration. They can but more fully understand and appreciate the condition of the canals, and their requirements, than other members of the Department (except the State Engineer), and it is to be regretted that reforms proposed by them have not received due attention.

The Commissioners present, yearly, their statement of anticipated expenditures for the coming fiscal year, and generally the sum asked for is placed in the hands of the Auditor. At the same session, relief bills, or bills directing the building of bridges, culverts, sewers, &c., are enacted, all to be paid from the repair fund, thus creating a deficiency, and depriving the Commissioners of moneys to pay their obligations for work done, or for meeting such exigencies as may arise.

Chapter 169, Laws of 1862, declares as follows: "All contracts for the enlargement and completion of the canals of this State

shall be executed and performed in accordance with the plans, maps and specifications heretofore prescribed and adopted, on or before the first day of September next after the passage of this act, and the accounts for the said enlargement and completion shall be closed as soon thereafter as may be, and no more work shall thereafter be done, or materials procured under pretense of enlarging and completing said canals, and the same shall be deemed finished and completed."

The portion of the law declaring the canals completed was a fiction, as such was not the case on the Western Division, and many very important improvements which were necessary and contemplated in the plan of enlargement were not perfected. This prohibition of the act I then deemed unwise, but as it was presented and urged as a matter of economy, and being desirous to co-operate in such efforts rather than oppose them, gave no opposition to the measure.

The result was to compel provision to be made for finishing enlargement works, which was done by a specific fund absurdly called an extraordinary repair fund, because, in fact, most of the moneys, especially on the Western Division, were used for enlargement work.

Under this system, differences of opinion arising among the members of the Canal Board, in whose hands the expending of the money was entrusted, works were done of enlargement, ordinary repairs, and new work not contemplated in the plan of enlargement, and therefore proper to be considered extraordinary repairs.

Quite a large amount of this fund was expended under the direction of the Legislature, for works not advised or recommended by the undersigned.

The change from enlargement to repair fund was unwise and has created much confusion and embarrassment, and has been eagerly seized upon by the enemies of canal interests, to abuse the public mind and impair their confidence in our public works. It afforded a fair opportunity, as it was known as a "repair" fund, to charge the whole amount to repairs, when the great proportion was enlargement work, important and necessary to be done.

At the last session the Legislature attached the following unusual clause to the annual canal appropriation bill: "and no part of the moneys appropriated by this act shall be paid to a contrac-

tor for repairs, or any other person for repairs done upon what is called a change of plan."

This has also proved a source of infinite embarrassment to the Commissioners, as they can not always replace structures which have failed, on the same plan as originally constructed, and by terms of the repair contracts—which are rigidly enforced when to the interest of contractors—the contractors are entitled to receive from the State all differences of cost, when increased over the expense of reconstructing work on the original plan. The undersigned has two aqueducts on the Genesee Valley canal, viz: the Scottsville and Shakers, which can not be replaced in the same condition as they were originally built. The plan must be changed, and it would be an outrageous act on the part of a public officer to consent to replace a structure whose plan, in its inception, was faulty, and which would again fail. As the law now stands the work must not be done, and navigation may be entirely suspended, or the agents of the State must violate the law. In such instances an extraordinary repair fund would remove the embarrassment, if there were any, and the Canal Board should see fit to vote an appropriation.

The foregoing statements are not made in a spirit of fault-finding or for self-defence, but are induced by the earnest desire to promote canal interests, and in the hope that they may arrest the attention of the Legislature.

From my experience as Commissioner for the past four years, I am satisfied of the absolute necessity of the Legislature to rescue the canals, and their management, from the unfortunate position in which they are now placed. The true remedy is to have responsibility of practical management vested in one Commissioner, with full authority to sustain his position, and independent of the vagaries of the many who now exercise control. One energetic man, thus situated, can better manage the entire canals than can a Commissioner now manage his Division, and with a large saving of money to the State. If three Commissioners are to have management, give them their old power and authority; abolish the repair contract system; codify and amend the canal laws, that a well-defined system may be established, both for practical management and financial accounts, that all the departments may move in harmonious action.

Under circumstances as detailed, the Commissioner might well

claim exemption from any charges of mismanagement, as he is invested with little responsibility.

Nor should the Commissioner be held responsible for large expenditures, when directed by the Legislature. Awards made in pursuance of legislative acts should not be charged as canal repairs, as is now the case. A relief act, under which sums of money must be paid by altering the terms of a contract, is not a canal repair. It is a *gratuity*—a *donation*—neither more nor less.

Accidents and floods have been unusually heavy upon the canals in my charge. They may occur again, and it is immaterial whether it may be on the Erie or Genesee Valley canal. If damages should be done upon the latter canal, to the extent of a million of dollars, it is my duty to repair the same with due diligence. I have no discretion in this matter, and think that the repairs of such casualties do not establish a character for extravagance upon a Commissioner.

The expenses of operating and maintaining the Genesee Valley canal, under the present system of repair account has been for the fiscal year 1865, $258,073.37.

Of this very large sum, $21,768.72 were awards made to repair contractors, under the general relief act in their favor, and were due to them from the fiscal year of 1864, but there being no funds on hand, were paid in the present fiscal year. Awards were made by the Canal Board for repairs of breaks, under relief acts, which occurred in 1863 and in 1864, and which amounted to $31,866.43. Those two sums were in no wise connected with the repairs of 1865, and it is improper to consider them as such, yet as such they will appear in the financial statements of Comptroller and Auditor.

The repairs of the breaks of August, 1864, were mostly completed in August and September, but as the account of the superintendent was not audited in the fiscal year ending September 30th, 1864, they become part of the expenditures of the fiscal year ending 30th September, 1865.

The amount paid for repairing the damages done by floods of 1864 and 1865 amount to $145,954.82, thus leaving but $58,483.40 properly chargeable to the ordinary expenses of operating the Genesee Valley canal for the fiscal year 1865.

Deferred payments of awards under general relief act, in favor of contractors on the Erie canal, amounted to $45,051.91. Payment on account of award to contractor on section 11, for repairs

of Oxbow break, $20,000. (A balance is due on same award of $31,973.36.) The repairs of breaks at Tonawanda and at Oxbow amount to, aside from award, $73,672.02. Each of those disasters were greater in extent and cost than any previously recorded on the Western division of the Erie canal. Deduct those items, amounting to $138,723.93, from the gross sum charged to repairs, and it leaves $142,737.57 as the ordinary expenses of the Erie canal.

The contractors on sections 13 and 14 were released from their contracts by the contracting board, and the sections were operated by the superintendent during the months of August and September, 1864, whose expenditures are charged to the fiscal year of 1865.

In fairly considering the causes of increased charges on canal funds, the rise of labor and materials must not be overlooked, they having increased since 1861 nearly one hundred per cent.

Repairs for Fiscal Year 1866.

A considerable amount of money is needed to place the Valley canal in proper condition for navigation the ensuing season, and the greater portion is to be paid by the State. To explain this statement, it must be understood that under the recent contracts made for repairs the contractor is only required to repair breaks to the extent of five thousand dollars, which has already been deducted from payments due to him, and as the repairs necessary were occasioned by the flood of March, 1865, they can not be charged against the contractor. The Scottsville and Shaker aqueducts are in this condition, as well as some minor structures. If the law of last winter, referring to "change of plan," is not amended, the aqueducts can not be repaired, and navigation may therefore be entirely suspended, unless the Legislature should appropriate an extraordinary repair fund, or make special provision therefor.

The cost of repairing the aqueducts will be $13,000, and it will require near $30,000 in addition to complete reconstruction of Portage trunk aqueduct, [which is exempt from repair contract,] reconstructing waste weirs, making spilways, &c. I have, in former reports, advised and recommended the making of Lime Lake reservoir, for the purpose of furnishing sufficient water for continuous navigation on the summit level of this canal. If navigation through the season is to be preserved, an additional reser-

voir must be provided. In my opinion the project of Lime Lake reservoir is the most feasible and likely to secure the result desired.

Surveys have been made, and maps and plan adopted by the Canal Board. The estimated expense is $160,000.

The re-building of old wooden locks on section two has been reserved to the State. At least three ought to have been re-built the coming winter, but, in the opinion of the undersigned, it is very poor economy to re-build wooden locks; in fact, no structure but of the most permanent character should ever become a part of the canals. Such works create no accidents, rarely are out of order, and will require no replacement and but small, if any, charges for annual repairs. It is economy to construct of stone, and if so built, an especial appropriation is necessary. They are estimated to cost $45,000.

No new works are asked for on the Erie in the shape of repairs, because they can not be made under existing laws, and will be stated under the head of extraordinary repairs.

An appropriation is necessary for reconstructing bridges in cities and villages, on change of plan. No less than two lives have been lost within one year by the failure of such structures, and I anticipate further casualties of that character. Prominent bridges in Rochester and Buffalo are dangerous, and known to be so by myself and engineers, yet I have no authority or power to save human life by changing plan. Iron bridges, when well built, are permanent and economical, yet it is held that a wooden bridge cannot be changed into an iron one without a special act is made, providing funds for them aside from the canal funds.

At least $25,000 should be placed in the control of the Canal Board for such purposes.

About $12,000 will be required to finish repairs of break at Tonawanda.

Clay Street bridge, in the city of Rochester, was destroyed by the flood of March last. The structure was not suitable for the business and the locality. It has not been replaced, as I could not change plan and pay for erecting such a bridge as was proper to be built. The common council of Rochester preferred that the street should remain without a bridge rather than replace on the old style. No doubt they were influenced by the belief that the Legislature would authorize and direct that a suitable bridge be

erected. I would respectfully advise that course. The expense will be about $5,000.

Extraordinary Repairs.

Such a fund is recommended—is necessary, unless radical changes are made as heretofore earnestly advised.

The following sums are necessary to pay for improvements which have been inaugurated as such works:

To pay to repair contractor, on section 10, for balance due him for raising, widening and strengthening banks, enlargement work	$1,798 74
To pay contract for work done on Clyde sewer, and for award made by Canal Board	2,929 88
To pay balance due contractor for improvement Clark and Skinner canal	5,417 65
To pay contractor on Oak Orchard creek, for work done, for excess of estimates occasioned by award of Canal Board, and for its completion	19,000 00
To pay contractors for section work between Black Rock and Buffalo, rendered necessary by award of Canal Board (enlargement work)	77,000 00
To pay arrearages and complete contracts now in existence for removing material from the bottom of canal between Brockport and Medina	25,000 00
The Clark and Skinner canal should be completed. It will probably cost	15,000 00
The Erie basin improvement will cost	10,000 00
The improvement of Main and Hamburgh Street canal requires the present year	5,000 00
Contingent, for changing plan of bridges, if not otherwise provided, strengthening banks, and for such other incidental works as may be deemed proper	35,000 00
Total	$196,146 27

This amount is necessary to complete work and pay obligations incurred.

In this connection it is proper to state that, with the exception of the items of Clark and Skinner canal, and improvement of weak banks, no obligations have been made by me. In the first work the amount exceeded the estimates, and the contractor preferred to execute his contract, notwithstanding he was informed there were no funds to pay with.

The Oak Orchard creek improvement in its inception was opposed by me, but it was authorized and directed by the Legislature, and sixteen thousand three hundred dollars appropriated from the extraordinary repair fund by same act. In the session of 1864 the State Engineer was directed to examine the work and prices of the contract, and to amend the same by increasing the rates, as might be deemed just and equitable, considering the rise in the cost of materials and labor. The Engineer increased the prices, which rendered an additional sum of money necessary to complete the work. In the session of 1865, an appropriation was made of $14,000, in accordance with estimates made by the Engineer Department, but the same act directed the Canal Board to

examine the claim and make a further increase of prices, if it was proper to do so. The Canal Board increased the rates, and the engineer of this division now estimates that nineteen thousand dollars will be required to pay the award and to complete the work, provided no further relief is granted. No benefit will be derived from the money expended unless the work is completed.

The section work last enumerated in the schedule was authorized by the Legislature, and nearly all the money required is rendered necessary by the award of the Canal Board, which increased the prices.

The work is excavating earth from the prism of the canal, laying up slope wall, raising and widening the banks in accordance with the plan of enlargement, and which was subsequently reaffirmed by the Canal Board.

I deemed this a most important work, as it was the channel through which the water from the lake was carried to the Montezuma marshes, and the narrowness of this outlet created in that locality a very strong current, which at times embarrassed the passage of boats. The effect of deepening this water-way, and excavating material between Lockport and Clyde, permitted boats to carry increased cargoes. The Canal Board, on the 12th of May, 1864, adopted a resolution authorizing boats to be cleared drawing six feet of water, instead of five feet and nine inches.

The history of the extraordinary repair fund has been given, and it is proper that the expenditures should be accounted for. They have been generally in the detailed statement, but for the purpose of showing to what purposes the greater portion have been used, the following is presented:

For completing construction section (enlargement) between Clyde and Buffalo, there has been appropriated, which is nearly consumed	$148,594 00
Deepening Erie canal in Buffalo (enlargement)	4,968 60
Repairs of culverts, improperly constructed in the enlargement	23,209 80
Increasing capacity of Oil Creek reservoir, Genesee Valley canal	7,809 37
Building new dam to increase the Genesee Valley canal, quantity of water furnished by Ischua feeder	5,994 07
Completing slip No. 3 (enlargement work)	3,185 44
Deepening channel Main and Hamburgh Street canal	1,893 24
Constructing feeder dam for Erie canal across Genesee river	4,209 24

ENLARGEMENT.

Iron bridge, Plymouth avenue, Rochester, directed by Legislature	3,294 32
Oak Orchard creek improvement, do do	17,175 00
For awards to contractors ordered by Legislature	13,769 38
Constructing New Home bridge, do do	15,460 43
do Pickard's bridge, do do	7,111 73
do sewer in Newark, do do	8,923 57
do do Clyde, do do	4,843 35
do do Albion, do do	1,219 76

Iron bridge on Michigan street, Buffalo	4,314 85
do Tonawanda	2,569 85
do and approaches, Elk street, Buffalo	5,332 37
Reconstructing Smith street and tow-path bridge, Rochester	2,291 68
Constructing approaches to bridge in Lyons (enlargement)	1,392 48
Improvement Hamilton Street bridge, Buffalo	336 33
Raising bridges in Newark (enlargement)	966 35
Securing waste weir at locks Berlin and Lyon, enlargement work improperly constructed	867 34
For raising, widening and securing banks, enlargement work, neglected	15,823 31
Improving walls and banks at Lockville and Poor House locks, enlargement work improperly constructed	2,450 00
Constructing Clark and Skinner canal bridge	15,669 14
For tow-path bridge, Buffalo, (properly enlargement work)	3.531
For changing channel of Genesee Valley canal and bridge approaches at York landing	1,740 75
For stopping leaks in prism of Ischua feeder	475 67
For constructing and reconstructing vertical walls in Port Gibson, Clyde and Hindsburgh	2,846 10
For engineering, inspecting, printing and advertising	8,211 40

Payments made for old accounts, constructing drains and sluices, testing new lock gates, temporary occupation of lands, purchasing and constructing lock houses, have consumed the appropriations, excepting a very small balance in the hands of the department.

It can not but be noted that a large portion of the above expenditures were made by legislative direction, and in some instances done in opposition to the judgment of the Commissioner. All of the works ordered by the Legislature were let to the lowest bidder, and but very few of the other works were done by the engineers or superintendents. Some of the work was from necessity done by the repair contractors who were under obligations to pay part of the expense, or, in the case of iron bridges and where works were not of an expensive character, it was deemed economy to have them made by superintendents, as the cost of advertising, printing and inspection have in some instances equaled the cost of the proposed improvement.

Navigation

Commenced on the Erie canal the 1st day of May, and was suspended on the 12th of December.

The accidents and detentions for the fiscal year have not been so great or numerous the preceding season, excepting the large break at the Oxbow embankment, which occurred near the close of navigation—the 25th of November, 1864.

The repairs of the break in the berme bank at lock Berlin waste weir, the repairs of Lyons aqueduct, the replacement of lock gates destroyed at Pittsfield lock, and replacing broken gates and

removing sunken boat from third lock east of Rochester occupied ten days.

To fill the levels occasioned by the few interruptions above noted, also created some days' detention before the levels could be filled.

Navigation commenced throughout the line of the Genesee Valley on the 20th of May, but parts of the canal were in use about the 1st.

Navigation was suspended on section 2 seventeen days in October, 1864, occasioned by the heavy floods of August. Fifty-nine days, in addition to the above, navigation was suspended at various sections of the Genesee Valley canal, but not through the entire line.

Enlargement of the Erie Canal.

In the winter of 1863 the undersigned urged the necessity of building additional locks upon the Western Division of the Erie canal, and succeeded in obtaining the passage of an act making provision for this necessary improvement. The bill was defeated in the Senate on the ground that when locks should be constructed they should be of the enlarged size; but strong opposition was urged on the ground that there was no necessity for them, and that it would require so large an amount of money, improper to be expended, while so much doubt and uncertainty existed in regard to the war in which we were engaged, and which was drawing rapidly upon the financial abilities of the nation. Another objection was found in the fact that exertions were being made in Congress to obtain a few millions of dollars to enlarge our canals, on the plea of military necessity, with a fair prospect of success, (the effort, so far as was authorized by the State, was degrading, and deserved to fail,) and that the closing of the Mississippi had diverted business which, upon the return of peace, would find its former channels.

All the objections presented and urged by apparent friends and open foes of the Erie canal, are passing rapidly away, and the fear that another outlet will be necessarily found has chilled the opposition of those who would be economists against the measure of enlargement.

There are persons who, from a fixed dogmatic opposition to works of internal improvement, are constantly denouncing your canals, and have persistently endeavored to show that they are

financial failures. This last argument in that respect has had an undue and unwarrantable influence.

It may be promptly denied, and the annual documents of the Auditor prove that the Erie and Champlain canals have never failed to pay more than the expense of keeping them in repair, and to furnish large sums of money, not only to liquidate their cost to the people, but to furnish millions to pay for the construction of lateral canals, which, with the exception of the Oswego, have never paid, in any one year, the cost of their management. Their deficiencies and payment of interest are annually taxing the funds of the Erie and Champlain canals.

It may be asserted with eminent propriety, that the canals of this State were not constructed for the purpose of revenue, that they were not intended as a financial scheme, the profits of which were to relieve the people from taxation, but for the practical and valuable results which were believed would arise from the communications to be opened up with the interior and undeveloped portions of the State, and in the grand project of the Erie canal to obtain the trade and commerce of the Western States.

The canal system has rapidly developed the resources of the State, has largely and with great rapidity increased the value of personal and real property, has given and continues to give employment to large numbers of our people, has created an active internal commerce, has secured the bulk of the trade of the great west, has added to the general wealth and prosperity and has accomplished to all intents and purposes more than its sanguine friends anticipated.

If such results, as above stated are true, the people could well afford to pay for them, and though the debt chargeable to the canals was much greater, it would be deemed the vagaries of an idiot to assume that, financially, they were failures.

It is undeniable, that the statements above made are correct in every essential point, and were it not for railroad competition they would be most popular institutions, and unable to perform the business pressing upon them.

Railroads were unknown when the Erie canal was projected, and there is no doubt that some of the canals of this State would not have been authorized, had there been such a carrying agent in existence; and it was not supposed when they became known that they were to become the great competitors of our canals. Their *rapidity and capacity*, as carriers, have transferred a vast amount

of traffic from the canals, and that they are destined to increase their competition cannot be denied, as the tables hereafter presented will exhibit, especially if improvements in canals cannot be made, which will cheapen their present cost of carriage.

Before proceeding to a work of such magnitude and great importance, it is proper to consider whether the canals have capacity to transact the ordinary business afforded to them, and if the improvements should be made, what are their character and cost, and what benefits will result therefrom?

In answering the first question it must be conceded that those who are personally observant of the business and embarrassments of the Erie canal, are the ones most proper to determine, and as sworn officers of the State their declarations should have greater force than the heads of departments at Albany, who have nothing to do with canals except as members of the Canal Board and as Commissioners of the Canal Fund.

The Eastern and Middle divisions of the Erie have double locks, while on the Western they are all single except the Lockport locks and one at Macedon. The commissioners of those divisions are not therefore as conversant with the difficulties arising from single locks as those in whose control they are placed.

My predecessor commissioner Gardner, in his last annual report, presented this subject in its proper light, and it is herewith presented as the views of a careful, prudent, and experienced agent of the State:

NAVIGATION AND REPAIRS.

"More than twenty years have passed since the commencement of the enlargement of the Western Division of the Erie canal. The suspensions and delays in the prosecution of the work by reason of the requirements of the means at command, for other and in some instances much less important parts of the public works, have caused the enlargement of the Western Division to be the last completed.

"The work is now so nearly done that (except as to some delays and inconveniences resulting from the want of double locks, where they are now single) the practical benefits of the enlargement are nearly, and by the opening of navigation in the spring may be fully realized.

"The size of boats navigating the Erie canal has been increased from about seventy by fourteen feet, as they were upon the old

canal, to about one hundred by eighteen feet, as they are now. Their draft of water has been increased from three feet six inches to five feet and nine inches, permitting an increase of cargo from seventy-five tons to nearly two hundred tons carried in the last season, and to two hundred and thirty tons, as they may be on the opening of navigation in the spring of 1862.

"Notwithstanding the largely increased capacity of the Erie canal, so much has the business increased, that in the season last passed the requirements for its accommodation have for weeks nearly and at times more than equaled the capacity of the locks to meet them. It is wise to anticipate and avoid any danger of a diversion of a trade from the canals to other more inviting because cheaper routes.

"The State has within its borders the most natural Atlantic market and outlet for the produce of the Western States, whose productive capacity is but just now beginning to be exhibited, and if the business of carrying to market these productions, and returning the supplies required by the producers, is not done through this State, it will be because channels will be found in which it can be done cheaper.

"The cost and promptness in doing the business will determine by whom, and upon what route it shall be done. To meet the requirements of the trade, and to enable the Erie canal to do the business cheap, and without unnecessary delay, some improvements should be promptly made upon the Western Division, the most necessary of which is in the locks.

"In the latter part of the past season, there have been times for several days in succession, when crowds of boats were collected at the locks, because of their inability to pass them as fast as they arrived. The most frequent and longest delays from this cause, have been at the combined and double locks at Lockport, and at the three single locks first east of Rochester.

"The delays at the Lockport locks have been partly caused by the necessity of keeping the water in the Lake Erie level above the height which will be required when the canal shall be completed. This has been necessary in the season passed, to overcome the difficulties arising from the unfinished state of the canal, and the progress of the work of excavation by dredging from the bottom of the canal. The effect of keeping the level too high is to overflow the lock gates and flood boats, if too many are allowed in the locks at a time."

"Single locks should be doubled; the experience of the past season has very clearly demonstrated the necessity of double locks upon the entire line of the Erie canal, and has shown that it is at least doubtful whether double locks, limiting boats to the present size will be able, without serious embarrassment, to do the business of the canal, if the cost of doing it, in comparison with other wants, is so kept as to secure to the canal its proper and natural share.

"But whatever may be said as to the policy of increasing the capacity of locks by extending their length, there is no doubt but the locks which are now single should be promptly doubled.

"There are upon the Western Division of the Erie canal fourteen single locks, thirteen of which are between Rochester and Clyde, and the other being the guard-lock at Black Rock. It is understood that the original plan of enlargement contemplated the doubling of all the locks, and that the omission to make double locks of those referred to, has been owing to the demand for the funds at command for the supposed more pressing, and for the time, important works. Now it is believed there is no work upon the Erie canal more important than the doubling the single locks referred to.

"Should the Legislature make provision for building the fourteen new locks necessary for this purpose, at an early period of the next session, the work could be let and the necessary preparations to protect it from the waters of the canal could be made before raising the water for the opening of navigation next spring, and perhaps the locks, or some of them, be completed in season for the pressure of the fall trade next season."

The estimated cost of constructing the thirteen locks between Rochester and Clyde, for the purpose of doubling the now single locks, is $412,000

To which should be added the cost of a new lock at Black Rock, to make double locks at that point, and which it is supposed may be built for 25,000

Total for doubling the locks $437,000

This report was made for the year 1861, and the total tonnage movement of the canals for that year was 4,507,635.

The succeeding year the total movement was 5,598,785 tons, of which the greatest proportionate increase was of property from the

Western States passing through the single locks. In my first annual report to the Legislature, the following may be found:

"There are fifteen locks between Rochester and Clyde. Two of those are double, the rest are single. Knowing that detentions had occurred at those locks in 1861, and anticipating the large business of the present year, preparations were made to place them in good condition prior to the opening of navigation, and every improvement that was likely to lessen detentions or to facilitate the passage of boats was made.

"The gates, valves, flooring and mitre sills were repaired and strengthened, bevels cut out, recesses cut in the head of the locks, that gates or locks might be repaired without drawing down the levels; sluices built around the locks, that no time should be lost in feeding through them; new gates framed and ready to replace such as should fail or be destroyed by accident; the shackle bars working the valves were changed for those less liable to be broken; walls at the head and foot of most of the locks were re-built or repaired; coping stones replaced and bolted down. After navigation, the forces were increased over the usual number, and agents were employed to keep boats moving both *day and night*.

"Yet owing to the increase of business and consequent increase in the number of boats, crowds collected, and it was impossible to prevent continued and embarrassing delays.

"The increase of canal business is mostly from the west. The tolls received on all the canals of the State in the year 1861 was $3,908,785, of which $2,102,012 was taken at Buffalo. It is estimated that the increase of tolls at Buffalo the present year will be near fifty per cent, or about $1,000,000; while the increase from the rest of the offices will not exceed fifteen per cent, or $270,000. The following table exhibits the rapid increase of lockage at the first lock east of Rochester, and the guard lock at Black Rock, both single, for the years below named:

	1859.	1860.	1861.	1862.
Brighton lock	11,080	18,337	20,553	.....
Guard lock	10,695	16,815	20,549	.....

To 1st of October, each year:

	1859.	1860.	1861.	1862.
Brighton lock	7,813	11,916	13,745	17,777
Guard lock	7,420	11,656	13,602	18,461

"It should be remembered that heretofore business upon the canals has been largest in the spring and fall, and that a part of

the summer has been styled the dull season. This year has been entirely different; business has been large and steady, and the *dull months* exhibit business as large as the spring months. Had the usual course of trade been continued, in this respect, it would have been impossible to have got through the single locks the amount of property transported this year. The tolls received in Buffalo, and the crowd at the locks, is sufficient to demonstrate this fact.

Received at Buffalo, May, 1862, (in round numbers)			$428,000 00
June,	do	do	407,000 00
July,	do	do	443,000 00
August,	do	do	407,000 00
Sept'ber,	do	do	516,000 00

"The receipts of June and July, 1861, were the smallest of that year, being, in June, $231,000, July, $217,000.

"It is manifestly the interest of the State to increase the capacity of the canals, to facilitate the passage of boats, which aids not only to retain the present volume of property carried through, but provides for a prospective increase.

"The large business of the past two years will cause the building of many boats, which, though adding to the tonnage capacity for carrying property, cannot increase the amount of tonnage carried through, because their addition will only increase the pressure at single locks, and increase the length of time consumed in the trip, thus costing more to the shipper, who seeks redress by adding the increased expense on the property.

"Trade can not be confined to any particular channel, but finds that pathway which insures safety, rapidity and economy.

"After very careful consideration of this subject, viewing the uniform and unparalleled steadiness of the business season with the reasonable expectation that it will not be again as steady, and knowing the difficulties attending the prosecution of that business, the Commissioner has come to the conclusion *that the capacity of the Erie canal for the transportation of property at single locks has been reached*, and that it is very doubtful if the same quantity can be again passed through.

"It is estimated that an additional tier of locks can be built for $412,000, and the lock at Black Rock for $35,000.

"It is believed that if the Legislature should, very early in the coming session, authorize the construction and provide for the payment, the locks can be built and probably all be brought into use in the month of September, 1863."

The detentions to boats at the locks were almost constant in 1862, and, as a necessary consequence, increased largely the cost of transportation, and the uncertainty as to when property should reach tide water, transferred much new business to railroads that had previously been moved on the canal.

Impressed with the importance of the subject, I again called the attention of the Legislature, in my annual report dated October, 1863, extracts from which follow:

ENLARGEMENT OF LOCKS.

"The Legislature, at the session of 1863, adopted a series of resolutions looking to the enlargement of the locks on the Erie canal. The estimates then directed to be made have not been completed at this date, and the amount of expenditure necessary to enlarge the locks is not definitely known.

"The undersigned represented to the last Legislature the great importance of this subject, and gave, as his opinion—see report, 1863, page 114—that 'after very careful consideration of this subject, viewing the *unparalleled* steadiness of the business season with the reasonable expectation that it will not be again as steady, and knowing the difficulties attending the prosecution of that business, the Commissioner has come to the conclusion *that the capacity of the Erie canal for the transportation of property at single locks has been reached*, and that it is very doubtful if the same quantity can be again passed through them.'

"The experience of another year has confirmed the opinion then expressed, and he deems it eminently proper to again explain to the Legislature that the business of the Western Division is greatly embarrassed by the single locks. It is, perhaps, not generally known that there are double locks on the Erie, with the exception of thirteen on the Western Division, and the guard lock at Buffalo.

"Last winter it seemed exceedingly doubtful to obtain the sanction of the Legislature for additional locks of a larger size than the present single ones, but their action seemed to recognize the propriety and necessity of increasing the lockage capacity over that now given by the present locks, and that the canal interests required initial action.

"The very large receipts from the business of the past two years make them memorable in canal history, and confirm the wise foresight of the projectors of our internal navigation, and the sound

policy of their successors in increasing its capabilities commensurate with the offerings of commerce.

"No question is now raised as to the great value of canals to the commercial and industrial interests of the citizens of the State, and the only question should be how this important interest is to be fostered and continued.

"The same reasons that demanded the enlargement of the Erie canal, act with greater force for the enlargement of the locks, because the business is increasing in a greater ratio now than then, and it is established that the business equals the capacity of the canal with its present locks.

"The time consumed in a trip from Buffalo to Albany is excessive, and can not be materially lessened while boats are towed by horse-power, and it has been demonstrated by actual test that it is not profitable to propel boats by steam which cannot carry over six thousand five hundred bushels of wheat. While the experiment was being tested, the State gave every encouragement, and gave such craft precedence at the locks, but the expense of carrying so small a cargo enabled horse-power to compete, in a financial point of view, successfully with steam.

"Engineers estimate that a boat two hundrd and ten feet long and twenty-five feet wide, with six feet draught of water, would carry, in addition to engines, fuel and ordinary accommodations for the crew, twenty-two thousand five hundred bushels of wheat—equivalent to three full cargoes now carried by our largest and best class of boats—and that with double locks on the entire line can be carried through in half the time now consumed in making a trip. Boats have not averaged, in the trip to Albany from Buffalo, the last nine years, quite one and three-quarter miles per hour. Three miles and one-half average per hour, is a very moderate calculation for boats to be propelled by steam.

"A large proportion of detentions has been occasioned by the crowd of boats at locks which would decrease as the boats are increased in tonnage. The reports from the Canal Department show that in 1847 the average tonnage of cargoes was sixty-seven, the time consumed in the trip ten and one-half days, the lockages at Alexander's lock 43,957, the greatest number recorded in any one year. In 1850 the tonnage had increased to seventy-six tons, the time making the trip decreased to nine days, the lockages to 38,444. In 1862 the tonnage was raised to 167 tons, the time

making the trip reduced to eight and one-half days, and the lockages were but 34,977.

"Experienced canal men assert that the present trunk, when complete, seventy feet wide and seven feet deep, has the capacity to do three times the amount of business now done *with the present class of boats*, if sufficient lockage capacity of the present size is afforded.

"The supply of water is worthy of consideration in discussing this subject. Of the supply upon the other divisions of the canals the undersigned can not, with confidence, express any opinion; but in reference to the Western Division, he has no hesitation in asserting the supply is adequate, and will require no additional resources.

"It is assumed by many that the closing of the Mississippi river has caused the large amount of business done upon our canals the three past years. It is not the purpose of the undersigned to enter into any arguments as to the expediency or propriety of the proposed enlargement, but to present facts bearing upon the same for the consideration of the Legislature, and therefore it seems proper to expose the very prevalent error of diversion from the Mississippi to the canals.

"The United States commercial report shows the exports from New Orleans for the year ending June 30, 1860, to be as follows.

"Wheat, 2,189 bushels.
"Flour, 80,541 barrels.
"Corn, 224,382 bushels.
"Meal, 158 barrels.
"Rye and other small grains, $9,042.
"Pork, 4,250 barrels and tierces.
"Hams and bacon, 890,230 pounds.
"Beef, 5,997 barrels.
"Cheese, 88,691 pounds.
"Butter, 95,851 pounds.
"Tallow, 1,909,155 pounds.
"Lard oil, 2,049 gallons.
"Linseed oil, 1,014 gallons.
"Spirits, 12,534 gallons.
"Potatoes, 20,580 bushels.
"Oil cake, $48,260.
"Shingles, 576 M.
"Board, plank and scantling, 614 M.

"Staves and heading, 6,128,000 pieces.

"Lard, 11,055,480 pounds.

"With the exception of the last two items, the statement shows how little influence the opening of the river will have upon the export trade of the country. The exports of staves and heading from New York, in the same time, was 33,877,000—of lard, 18,542,131 pounds.

"The items in the above list are the bulk of western productions, and the foreign exportation of such articles has never sought the Mississippi as a profitable or natural channel.

"The increase of tonnage upon the canals is attributable to the vast and increasing producing population of the west, whose rich lands grow abundant harvests, and which, with remunerative prices, pour forth commodities beyond the present ability of canals or railroads to carry away. In 1840 the tonnage arriving at tide water by the Erie canal, from the western states, was but 158,148 tons. In 1845, 304,551 tons. In 1850, 773,858 tons, In 1855, 1,092,876 tons. In 1860, 1,896,975. From the State of New York to tide water in 1860, but 379,000 tons. In 1862, from the west, 2,594,837 tons, while from the State it was but 322,257 tons.

"The increase in 1860 over 1850 was upwards of 1,100,000 of tons, and in 1862 over 1850, was over 1,800,000 tons. This vast increase is in the short period of ten and twelve years. At the commencement of that period there was but one railroad connecting the seaboard with the lakes, and that road was restricted in carrying freights by the imposition of tolls. In the year 1851, the tolls were removed from the New York Central road. In the same year the New York and Erie was completed, and the Ogdensburgh and Boston line opened. In 1853 the Baltimore and Ohio road commenced its through business. The Grand Trunk, (in Canada) the same year. The Pennsylvania Central in 1854, and the Great Western (Canada) in the same year.

"Those companies have been steadily increasing their transportation facilities. The tonnage of the New York Central, in 1853, was but 360,000 tons—in 1862, 1,387,433 tons. The tonnage of the New York and Erie, in 1853, was 639,031 tons—in 1862, 1,632,955. The indications of increase of business from the lakes to the seaboard, as given in the business of the two companies above named, is sufficient to satisfy the most incredulous of the

vast business done by railroads, and to indicate how great their competition with the Erie canal may be when crops are light and export demand reduced."

After another year's experience in canal management, and at the time of rendering my last report, I deemed it an act of duty on my part to again call attention to this subject. During the session of 1864 an effort was made to initiate legislative action, but without avail. Nothing was accomplished save to create interest enough to make inquiry of the Canal Board as to what course should be pursued. Their action and my suggestions are as follows:

ENLARGEMENT OF LOCKS.

"The Commissioner believing a highway through the State adequate to the conveyance of property, that may demand transit, at fair and reasonable charges, to be of the utmost importance to the commercial and business interests of the people of this State, again presumes to call the attention of the Legislature to this subject.

"The present canal capacities are insufficient for the amount of property created west of Buffalo, which seeks tide water.

"No argument is necessary to demonstrate this fact; the reports of Commissioners and State engineers inform you that detentions are frequent where single locks exist, and have been so since 1860; and they have repeatedly urged the Legislature to take action, looking to additional facilities for the business pressing upon the canals.

"It has been asked that additional locks be constructed where there are now but single ones. A bill passed the House of Assembly to that effect, in the session of 1863, but failed in the Senate, on the ground that when locks should be built they should be of enlarged size, and the Senate directed a survey to be made, showing the plans with maps, and estimated cost of constructing a new tier of locks on enlarged plan.

"The State Engineer caused the surveys to be made and presented his report to the Legislature. Nothing is wanted to commence the work but action on the part of the Legislature.

"The Assembly made the following inquiry in their session of 1864:

Resolved, That the Canal Board be and they are hereby required to take into consideration the propriety and necessity of enlarging the locks upon the Erie and Oswego, Cayuga and Seneca canals. If said Board is satisfied that such enlargement is necessary and proper to be made, they are to report a plan, such as in their judgment will best pro-

mote the interests of the State, with a view to economy and prompt execution of the project.

They are also required to report what improvements are to be made in the walls and prism of the canals, with a view to afford a speedy transit to boats of increased length, drawing six feet of water, together with an estimate of the entire cost of all the proposed improvements, the length of time probably requisite to execute the same, with such other suggestions and recommendations as they may deem important to communicate, and answer as speedily as may be practicable.

"The Canal Board presented an answer (a portion of which is found below), which they afterwards recalled:

In answer thereto they respectfully beg leave to represent,

That the Erie canal has, during the last two years nearly reached its maximum capacity for the transportation of property seeking tide water.

That, by reason of the large number of boats necessarily employed to move the tonnage, frequent crowds have been occasioned at the locks and at other places, creating embarrassing and vexatious delays, increasing the time of passage, and materially increasing the cost of transportation.

That the large amount of business now transacted upon the canals, demands and should have additional facilities, and in our opinion the retention of the present trade requires some radical improvements.

That the trunk line of the canal is capable of sustaining the pressure of a large and steady accumulation of trade for many years, and that, to fully appreciate and realize the value of the enlarged canals, it is necessary that the locks should have comparative capacity with them.

That by thus increasing the capacity of the locks to pass a greater amount of property, the delays complained of would be avoided, the time of passage reduced, and the carrying of large cargoes instead of small ones, would sensibly reduce the cost of transportation.

That such a reduction would retain our present trade, and secure a large proportion of the increased productions of the Western States, which would naturally seek the channel of communication with the seaboard.

That the present unavoidable high rates of transportation tend to divert trade into other channels, and has a strong tendency to encourage the opening of new and rival routes.

That in our opinion a much greater necessity now exists for the initiation of improvements in our canals than in 1835, when the project of "enlargement" was determined upon.

In the year 1837, the tolls received from the productions of our State, and for merchandise passing west, were $1,032,507; from products from Western States, $160,116. In the year 1862, the tolls received from products of the State and for merchandize were $1,465,735, while the receipts from products of Western States were $3,722,208. The enlargement was for the "purpose of providing a cheap method of intercommunication, and securing the growing trade of the west," the propriety of which has been fully demonstrated, and the notable difference in commercial relations between the years 1837 and 1862, seem equally to demonstrate the propriety and necessity of corresponding preparations to provide for similar results.

The following table is presented showing the tolls and tonnage from production of our State, and from the Western States for a series of years. The table is from the Auditor's report on tolls and tonnage for the year 1862, the report for 1863 not having yet been published.

TRADE OF THIS STATE AND OF THE WESTERN STATES.

"The following table shows for each of the preceding twenty-six years, how much of the tolls received in each year of navigation was on "products from Western States," how much was on "products of this State," and how much was on "merchandise going from tide water:"

Year.	Tolls on agricultural and other products. From other States.	From this State.	Merchandise from tide water.	Total on all canals.
1837	$160,116	$723,756	$408,751	$1,292,623
1838	247,241	803,967	539,703	1,590,911
1839	310,072	756,723	549,587	1,616,382
1840	427,480	865,758	482,510	1,775,748
1841	500,630	924,326	609,927	2,034,883
1842	467,792	827,841	453,565	1,749,198
1843	623,297	892,151	566,142	2,081,590
1844	676,032	1,088,274	682,068	2,446,374
1845	677,922	1,240,678	727,582	2,646,182
1846	1,013,478	1,100,699	641,929	2,756,106
1847	1,583,500	1,213,761	837,943	3,635,204
1848	1,157,905	1,213,060	881,402	3,252,367
1849	1,101,860	1,261,229	905,139	3,268,226
1850	1,137,731	1,222,877	913,291	3,273,899
1851	1,251,390	1,027,124	1,051,213	3,329,727
1852	1,304,018	1,013,990	799,650	3,118,244
1853	1,383,422	945,968	875,328	3,204,718
1854	985,647	1,007,847	780,072	2,773,566
1855	1,148,098	857,359	799,620	2,805,077
1856	1,247,765	743,668	756,770	2,748,203
1857	899,380	674,057	472,204	2,045,641
1858	944,109	888,259	278,386	2,110,754
1859	813,154	682,405	228,386	1,723,945
1860	1,650,978	991,216	367,353	3,009,597
1861	2,682,969	957,697	268,119	3,908,785
1862	3,722,208	1,093,533	372,202	5,188,943

"The statement below gives the total tonnage arriving at tide water by way of the Erie canal for a series of twenty-six years, distinguishing between the tonnage from this State and the tonnage from Western States:

Year.	From Western States, tons.	From this State, tons.	Total tons.
1837	56,255	331,251	387,506
1838	83,233	336,016	419,249
1839	121,671	264,596	386,267
1840	158,148	309,167	467,315
1841	224,176	308,344	532,520
1842	221,477	258,672	480,149
1843	256,376	378,969	635,345
1844	308,025	491,791	799,816
1845	304,551	655,039	959,590
1846	506,830	600,662	1,107,270
1847	812,840	618,412	1,431,252
1848	650,154	534,103	1,184,337
1849	768,659	498,068	1,266,724
1850	773,858	598,201	1,371,859
1851	966,993	541,684	1,508,677
1852	1,151,978	492,721	1,644,699
1853	1,213,690	637,748	1,851,438
1854	1,100,526	602,167	1,702,693
1855	1,092,876	327,839	1,420,715
1856	1,212,550	374,580	1,587,130
1857	919,998	197,201	1,117,199
1858	1,273,099	223,588	1,496,687
1859	1,036,634	414,699	1,451,333
1860	1,896,975	379,086	2,276,061
1861	2,158,425	291,184	2,449,609
1862	2,594,837	322,257	2,917,094

"In addition to the remarkable increase of tonnage thus exhibited, a corresponding increase is found in the tonnage of competing lines of railways, none of which were in existence when the enlargement of the canal was commenced. The Board cannot, without much delay, procure full and official statements of the amount of property carried over the Pennsylvania canals, the Baltimore and Ohio, the Pennsylvania Central, the Great Western, Grand Trunk, and Collingwood railways, the Welland canal, and by the Ogdensburgh route; but the increase of traffic upon the New York Central and the New York and Erie roads, indicates the comparative increase on the various lines of communication. The tonnage exhibited in the table below, relating to the New York roads, is from the Auditor's report, and the succeeding statement is from a carefully collated trade report, which has much merit, and is worthy of careful attention.

	Canals and Railroads.	Tons.
1853.	New York canals	4,247,853
	New York Central railroad	360,000
	New York & Erie railroad	631,039
		5,238,892
1854.	New York canals	4,165,862
	New York Central railroad	549,304
	New York & Erie railroad	743,250
		5,458,916
1855.	New York canals	4,022,617
	New York Central railroad	670,073
	New York & Erie railroad	842,048
		5,534,738
1856.	New York canals	4,116,082
	New York Central railroad	776,112
	New York & Erie railroad	943,215
		5,835,409
1857.	New York canals	3,344,061
	New York Central railroad	838,791
	New York & Erie railroad	978,066
		5,160,918
1858.	New York canals	3,665,192
	New York Central railroad	765,407
	New York & Erie railroad	816,954
		5,247,553
1859.	New York canals	3,781,684
	New York Central railroad	834,319
	New York & Erie railroad	869,073
		5,485,076
1860.	New York canals	4,650,214
	New York Central railroad	1,028,183
	New York & Erie railroad	1,139,554
		6,817,951
1861.	New York canals	4,507,635
	New York Central railroad	1,167,302
	Erie railway	1,253,418
		6,928,355

	Canals and Railroads.	Tons.
1862.	New York canals	5,598,785
	New York Central railroad	1,387,433
	Erie railway	1,632,955
		8,619,173

Statement showing the quantities of flour and grain sent eastward from the lake regions, comprising Ohio, Indiana, Michigan, Illinois, Wisconsin, Iowa, Minnesota, and Canada West, during the last eight years:

1856.

	Flour, bbls.	Wheat, bush.	Corn, bush.	Other grain, bush.
Rec'd at west. ter. B. & O. R. R.	449,797	.....	.....	487,100
Of Pennsylvania Central railroad	215,000	.....	.....	405,872
Dunkirk	350,000	.....	.....	.....
Buffalo	1,211,189	8,465,671	9,632,477	2,925,519
Sus. Bridge	304,524	.....	.....	900,000
Oswego	202,930	8,382,398	3,589,211	619,280
Ogdensburgh	354,964	610,937	477,975	37,432
Cape Vincent	65,000	500,000	45,000	50,000
Montreal	712,038	1,546,352	637,969	67,366
Totals eastward	3,865,442	19,505,358	14,282,622	4,592,569

1857.

Rec'd at west. ter. B. & O. R. R.	426,801	.....	.....	256,183
Of Pennsylvania Central railroad	351,011	.....	.....	206,793
Dunkirk	354,072	93,433	114,652	.....
Buffalo	925,411	8,383,875	5,720,413	1,321,456
Sus. Bridge	180,194	148,138	.....	.....
Oswego	101,363	5,353,026	2,003,992	370,249
Ogdensburgh	361,578	598,523	517,076	14,740
Cape Vincent	60,472	477,375	40,537	49,408
Montreal	637,052	1,708,965	383,162	38,165
Totals eastward	3,397,954	16,763,285	8,779,832	2,256,944

1858.

Rec'd at west. ter. B. & O. R. R.	682,314	.....	.....	330,871
Of Pennsylvania Central railroad	450,000	.....	.....	250,000
Dunkirk	331,007	186,499	94,905	24,965
Buffalo	1,614,520	10,735,909	5,621,668	2,789,678
Sus. Bridge	200,410	102,694	.....	.....
Oswego	95,720	6,572,432	2,913,618	1,292,424
Ogdensburgh	381,634	790,178	720,236	44,126
Cape Vincent	72,633	410,191	40,000	156,631
Montreal	664,275	1,769,482	105,087	136,537
Rochester	7,110	276,505	.....	9,865
Totals eastward	4,499,613	12,843,850	10,495,554	5,035,097

1859.

Rec'd at west. ter. B. & O. R. R.	466,403	17,800	.....	196,406
Of Pennsylvania Central railroad	350,000	.....	.....	150,000
Dunkirk	432,052	263,462	77,914	14,400
Buffalo	1,502,191	9,550,998	3,151,387	1,993,140
Sus. Bridge	41,374	57,562	.....	73,346
Oswego	64,941	4,875,489	804,646	1,842,010
Ogdensburgh	294,569	769,010	298,519	64,702
Cape Vincent	9,390	266,735	20,100	216,435
Montreal	597,583	638,700	72,430	204,652
Rochester	1,764	416,811	.....	8,900
Totals eastward	3,760,274	16,865,708	4,423,006	2,264,051

1860.

	Flour, bbls.	Wheat, bush.	Corn, bush.	Other grain, bush.
Rec'd at west. ter. B. & O. R. R.	352,413	.....	.....	126,393
Of Pennsylvania Central railroad	526,660	.....	.....	864,160
Dunkirk	542,765	500,888	644,081	8,843
Buffalo	1,122,335	18,502,649	11,386,217	1,632,920
*Sus. Bridge	650,009	.....	.....	1,875,009
Oswego	121,185	9,449,461	4,966,952	2,043,535
Cape Vincent	28,940	203,878	73,300	186,597
Ogdensburgh	248,200	565,022	867,044	48,211
Montreal	608,309	2,686,728	138,214	915,648
*Rochester	5,250	425,765	.....	10,725
Totals eastward	4,106,057	31,334,391	18,075,778	7,712,032

1861.

Rec'd at west. ter. B. & O. R. R.	270,000	.....	.....	80,000
Of Pennsylvania Central railroad	1,055,028	.....	.....	1,948,256
Dunkirk	736,529	604,561	230,400	7,175
Buffalo	2,159,591	27,105,219	21,024,657	5,532,770
Sus. Bridge	758,915	.....	.....	2,675,948
Oswego	147,087	9,809,495	5,508,799	1,796,213
Cape Vincent	65,407	276,610	124,411	104,591
Ogdensburgh	441,488	677,386	1,119,594	25,666
Montreal	937,324	7,390,355	1,516,767	1,504,507
*Rochester	2,500	520,618	.....	10,990
Totals eastward	6,533,869	46,384,144	29,524,628	10,686,116

1862.

Rec'd at west. ter. B. & O. R. R.	690,000	.....	.....	550,000
West. ter. P. C. R. R.	890,096	.....	.....	1,622,893
Dunkirk	1,095,365	112,061	149,654	10,173
Buffalo	2,846,022	30,435,831	24,288,627	3,849,620
*Sus. Bridge	875,000	.....	.....	2,750,000
Oswego	235,382	10,982,132	4,528,962	1,467,823
Cape Vincent	48,576	306,403	249,360	47,047
Ogdensburgh	576,394	689,930	1,120,176	18,865
†Montreal	1,174,602	8,534,172	3,661,261	961,066
*Rochester	1,000	150,000	.....	6,622
Totals eastward	8,433,037	51,220,529	32,998,049	11,286,109

1863.

Rec'd at west. ter. B. & O. R. R.	750,000	.....	.....	410,000
‡West. ter. P. C. R. R.	850,000	.....	.....	1,800,000
Dunkirk	629,230	86,905	191,035	11,789
Buffalo	2,987,089	21,240,348	20,086,952	8,385,945
‡Sus. Bridge	775,000	.....	.....	1,500,000
Oswego	115,292	8,785,425	2,676,367	2,364,109
Cape Vincent	24,236	206,856	81,698	15,730
Ogdensburgh	475,465	600,299	1,057,299	25,000
†Montreal	1,193,108	5,509,119	862,534	1,405,478
‡Rochester	1,500	85,000	.....	25,000
Totals eastward	7,782,920	36,513,952	24,955,885	15,983,112

*Estimated.

†These figures are from the Montreal Board of Trade Report for 1863. The Montreal *Witness* says the total receipts of breadstuffs, in bushels, were 25,237,291, in 1862, and the exports were 16,662,626 bushels.

‡These figures are from the Montreal Board of Trade Report.

"The present seems to be auspicious in a financial view for commencing the improvement of the main lines of our canals. The finances of the Canal Department are in a flourishing condition, as will be seen by reference to the Auditor's financial report for the fiscal year ending the 30th of September. There was at that time in the treasury, to the credit of the various canal sinking funds, $4,605,144.58, besides having paid, of the canal debt, during the same fiscal year, the sum of $713,800, none of which was due, and which was purchased at a premium.

"In addition to the above, there was a surplus of $981,376.17 from that fiscal year, which, added to the surplus revenue of the preceding year of $685,348.69, makes an aggregate amount in two years, subject to the disposal of the Legislature, of $1,636,724.86.

"If the Legislature should, in their wisdom, select the quickest method to secure the completion of the improvements, by submitting a law for the approval of the people at an early day, providing for borrowing the necessary amount of money for a period of eighteen years, it is reasonable to conclude that no additional taxation will be imposed upon the people to pay the yearly interest, and provide a sinking fund to discharge the principal when it becomes due, because the amount necessary to pay the annual interest and provide such a sinking fund (estimating the rate of interest to be at five per cent) would require annually but $752,181.90, not an average of the amount of surplus revenues received for the past two years, and which revenues will be increased by the diminution of the canal debt, and by the reasonably anticipated increased business of the canals.

"If a law should be enacted, and referred to the people of the State, as soon as may be constitutionally done, and be approved by them, the improvements could be completed by the opening of navigation in 1866.

"The locks of the Cayuga and Seneca canals being of the same capacity as the locks on the Erie and Oswego canals, the Board, at present, make no recommendation in relation thereto.

"The undersigned has experienced great difficulties and annoyances by reason of the single locks on his division of the Erie canal. The other sections have double locks, and it has been impossible to prevent delays at the locks, on account of their inability to transact the same business as done by the double locks on the other divisions.

"No one now doubts the necessity of enlarged locks, but many doubt the propriety of commencing so much of an undertaking in the present disturbed condition of the country.

"The undersigned will not pretend to argue this question; but he suggests, in deference to the wishes of the most timid, is it not best to commence building locks sufficient to pass a boat two hundred feet long and twenty-five feet wide, where there are now single locks? Additional facilities are demanded—are absolutely necessary; and in this manner the present wants, as well as the future, will be subserved."

Hon. Wm. B. Taylor, State Engineer and Surveyor, has repeat-

edly called attention to this improvement. In his annual report for 1862, he says: "The season of navigation just closed has shown conclusively to my mind the necessity of constructing double locks on the western division where single ones now exist. Numerous delays have been caused in consequence of the frequent inability to pass boats through the single locks as fast as they arrive. This was seriously felt in August last, after the breach at Knowlesville, it being weeks instead of days before the crowd of boats, which had accumulated during the repairs, could be disposed of."

Also in 1864 he remarks: "Attention is again directed to the construction of a tier of locks at those points where only single locks are located. The necessity is so self-evident, and their utility so obvious, that I need only urgently recommend their immediate erection."

It would seem self-evident, without further statements or arguments, that the first inquiry is fully answered.

To the second I need only refer to the very careful, minute and detailed report of the State Engineer and Surveyor in answer to the following. The report bears date February, 1864.

JOINT RESOLUTIONS OF THE SENATE AND ASSEMBLY OF THE STATE OF NEW YORK, IN RELATION TO ENLARGING THE LOCKS ON THE ERIE CANAL.

"At a joint meeting of the canal committees of the Senate and Assembly, to take into consideration the increased and constantly increasing tonnage on our canals, held in the Senate chamber, March 25th, 1863, and adjourned from time to time, for consultation upon the subject, they have agreed upon the following resolution, which, if adopted and carried out, will inaugurate a policy that will continue to this State its share of western trade and tonnage; therefore,

Resolved (if the Assembly concur), That the State Engineer and Surveyor, under the advice and direction of the Canal Board, cause a survey and estimate to be made of the cost of constructing one tier of locks on the Erie canal, from Hudson river to Lake Erie, and one tier of locks on the Oswego canal, from Syracuse to Lake Ontario, and one tier of locks on the Champlain canal, from Troy to Whitehall, and one tier of locks on the Cayuga and Seneca canals, from Montezuma to Seneca lake; the said locks to be constructed in a permanent manner of stone, or of wood, or of wood and stone combined, and to be not less than

twenty-six feet wide in the chamber, and not less than two hundred and twenty-five feet in length between the gates; the cost of each kind of lock to be estimated separately; to be located alongside of, or near to, the present locks, and calculated for seven feet depth of water in the canal.

Also, to cause a survey and estimate of the quantity of excavation and other work connected therewith, necessary to maintain locks thus enlarged, free from tolls, for the vessels, gunboats, troops and munitions, military and naval, of the United States, and to render its fair equivalent to the State by contributing justly to the cost of the work; therefore,

Resolved, That the Governor be and hereby is empowered and requested to invite the President of the United States to select and detail a competent engineer in behalf and at the expense of the General Government, to consult with the engineers so to be appointed by the Canal Board, in respect to the surveys mentioned in the preceding resolution, and as to the mode of constructing the work so as most effectually to promote the national interests."

The State Engineer fully states the cost and the character of the work.

The answer to the third inquiry is to be found in the fact that the enlargement of the Erie canal—see State Engineer's report above mentioned—actually reduced the cost of transportation on the Erie canal fifty and one-half per cent, and he estimates the present proposed enlargement would reduce the rates fifty per cent lower than they now are. The following is an extract from his report on that point:

Cost of transportation per ton per mile.

Old boats..... $= \frac{31.47^c}{76} = 4\frac{14}{100}$ mills per ton per mile.

Present boats..... $= \frac{45.37^c}{210} = 2\frac{16}{100}$ do do

Proposed large boat... $= \frac{72.25^c}{690} = 1\frac{4}{100}$ do do

equals a reduction of fifty per cent in the cost of transportation, by enlarging the locks to two hundred and twenty-five feet between quoins, and twenty-five feet width of chamber at water line of lower level.

"The conclusions arrived at are that by enlarging one tier of the present locks, and constructing a new enlarged lock by the side of present single ones on the Erie canal, at an expense of $10,380,-169.75 (which includes land damages, altering structures, removing

bench walls, and deepening the canal one foot), the same results are obtained in cheapening the cost of transportation, as by the original enlargement, at an expense (deducting interest on loans) of $32,008,850.40.

"The following statement will show the actual receipts and the actual cost of transportation upon the principal railroads of this State, and the Erie canal, with present locks, and when enlarged:

Per Ton per Mile, 1862.

LINE OF TRAFFIC.	Actual receipts.	Actual cost.	Profits.
Erie canal, with enlarged locks	0.58 cents.	1 4-100 mills.	0.476 cents.
Erie canal	0.58 "	2 16-100 "	0.364 "
New York Central railroad	2.23 "	1.39 cents.	0.84 "
New York and Erie railroad	1.89 "	0.95 "	0.94 "
New York and Harlem railroad	3.74 "	2.82 "	0.92 "
Hudson River railroad	2.26 "	1.20 "	1.06 "
Rome, Watertown and Ogdensburgh	3.12 "	1.97 "	1.15 "
Oswego and Syracuse railroad	3.49 "	1.72 "	1.77 "
Northern railroad	2.05 "	1.19 "	0.86 "
Syracuse, Binghamton and New York	1.26 "	0,41 "	0.85 "
Buffalo, New York and Erie	2.03 "	1.22 "	0.81 "
Buffalo and State line	2.78 "	1.45 "	1.33 "

This statement is a remarkable one, and fully answers the last inquiry. The benefit resulting would be to retain and increase our traffic, allay the efforts made to divert our business into new channels, the most prominent of which and most to be feared is through foreign territory, and above all to maintain the commercial supremacy of the State.

Attached is a statement of the cost of enlarging and building locks on the Western Division, and it is hoped that at the present session measures will be taken to inaugurate an improvement which is of so much importance to the people of this State.

Very respectfully submitted,

F. A. ALBERGER,

Canal Commissioner.

BUFFALO, *October 1st*, 1865.

APPENDIX A.

ENGINEER'S OFFICE, WESTERN DIVISION OF THE N. Y. STATE CANALS, ROCHESTER, *Jan. 4th*, 1864.

Hon. W. B. TAYLOR,

State Engineer and Surveyor:

Sir—I have the honor to submit the estimates for the cost of gunboat locks on the western division of the Erie canal, as contemplated under par. 2, sec. 1, chapter 211, Laws of 1863.

The surveys were made under the direct supervision of Walter W. Jerome, assistant engineer on the western division of the State canals (who has been employed for several years in charge of the location and construction of works for their improvement), assisted by J. N. Tubbs, a civil engineer experienced in the construction of the public works of the State, to whose services I am indebted for the minute details necessary to arrive at a thorough estimate of the cost of the work contemplated.

The examinations were commenced in June with a small party of assistants, and were prosecuted and completed during the most favorable portion of the season.

The estimates and maps were prepared by the same engineers taking sufficient time to mature the plans and ascertain the quantities in all their details.

The prices for the work used in the estimate are made to conform to the high prices of the present time, and are, on an average, fifty per cent. higher, both for materials and labor, than the prices paid by the State for similar work done during several years previous to 1861.

The prices are deemed ample, in case a sufficient length of time should be given to perform the work without disturbing or very far interfering with other great industrial pursuits in the State; while, should an early completion be demanded, and the work be prosecuted rapidly, so as to divert labor largely from other chan-

nels where it is now fully employed, the prices should be higher, and consequently the cost of the work would be increased.

I have examined the location for the structures, scrutinized the details of the estimates, and made a careful investigation of the prices at which work can now be performed, and submit with full confidence that the estimates provide a fair and ample sum for the cost of the improvements.

On this division there are now nineteen lift locks and two guard locks on the canal, also two lift locks connecting the canal with Niagara river.

It is proposed to make three less of the gun-boat locks, by placing them on the most feasible location.

The estimates provide for the cost of the locks, and of the structures at each end of them, to make the work complete; also for making the channel of the canal of sufficient width to pass the gunboats by each other, and for excavating in the bottom so as to leave a fair space between the bottom of the gunboats and the bottom of the canal.

Of the nineteen lift locks on the canal, thirteen of them are single and six double. Both of the guard locks, and both of the locks connecting the canal with Niagara river, are single. The gunboat locks are located generally alongside the single ones.

The exceptions are at Lockville, where a far better location is obtained on a new line, by building two gunboat locks instead of following the present line and building three locks. Again at Tonawanda, where the canal is connected with Niagara river, the gunboat lock has its location half a mile west of the present structure.

At Lockport, where there are now in use five double combined locks, the tier of gunboat locks should be placed entirely south of those now in use.

The requirements of commerce are so great that no risk of any interference whatever with its transit should here be permitted, by attempting to change any of the walls of these locks.

It is proposed to overcome by three locks the lifts of the five now in use at Lockport.

Where the proposed locks are placed by the side of those now built, they are in general so located, that the lower ends correspond with each other, the upper end of the new extending above the head of the old locks.

The four locks next west of Cayuga marshes, Nos. 53 to 56, are

located on the north side of the present structures, and opposite from the towing-path side of the canal.

At lock No. 55, Lyons, the improvement will require the removal and rebuilding of one bridge abutment below and one above the lock, for greater width of waterway. Two new superstructures, proposed to be constructed of iron, will be required to replace those now in use; also at the bridge below lock No. 56 it becomes necessary to widen the waterway and take down and rebuild one abutment. The bridge superstructure, of iron, now in use below the Lyons lock, will answer for this structure.

As mentioned in a former part of this report, the most feasible location at Lockville is on an entirely new line, requiring the construction of a new canal, three-quarters of a mile in length, two locks of twelve feet lift each, one culvert and one road bridge. These two locks will be used in place of three on the present line, viz., No. 57, 58 and 59. The new is on the north side of the present line of the canal.

In addition to the above, and in order to use the present canal for passing by the intersection of the old and new lines, this change will require the construction of two new towing-path change bridges over the present line of the canal, and the lengthening of the abutments of a road bridge in Newark, in order to place an additional truss thereon for a towing-path change bridge; also the taking up and rebuilding of the abutment of present towing-path bridge below the locks, the erection of a new superstructure thereon, and the construction of a towing-path on the south side of the canal for the distance of about a mile.

Lock No. 60 will be placed on the north side of the one now in use which is also on the berm; at Lock No. 61, Macedon upper locks, which are now double, it is proposed to place the gunboat lock wholly on the south side of the present ones.

It will also be advisable to make a new towing-path on the south side of the canal, connecting at the change bridge, thirty chains below the lock, and joining the present towing-path at Macedon bridge; distance, half a mile. This will require the extension of the bridge abutment, and the addition of one truss for use of change bridge.

The location of locks Nos. 62 to 66 are to be south of the canal, on the opposite side from the towing-path. It is desirable to form a towing-path for 100 chains on the south side of the canal from the second bridge below lock No. 63 to first bridge above same,

on account of the curve in the canal. These last named locks are next east of Rochester.

The new locks at Lockport, located alongside of the present ones, and on the south side, to be 3 in number of some 18½ feet lift each, instead of 5 of about 11 feet lift each, now in use. The upper end will conform to the head of the present locks, and the extension will be down stream.

This location will require a change in the State race, a new channel for which must be made further south, and the manner of passing the water from the upper level to the lower will be changed from an inclined plane now in use to a succession of drops over breast walls, which will obviate the damage from the swift current in the present structure. It will also be necessary to widen the canal along the two bridges above the locks, viz., Cottage street bridge and the wide bridge in Main street.

In place of the latter wood bridge, it is proposed to erect 2 iron ones. The span will be too great to build on the present plan without higher trusses; and to replace the wood superstructure in Cottage street by one of iron, a bridge over new State race in Pine street will be necessary.

The new location of the guard lock at Sulphur Spring, 5 miles west of Lockport, to be in line of the present south space of bulkhead, and the new guard lock at Black Rock to be placed on the north-west side of the present lock, also in line of walls of bulkhead. A new bulkhead in part and a channel for feeding the level below will be required at the last named lock.

The connection with Niagara river at Tonawanda to be at a point half a mile west of the present lock. It will be impracicable to improve the present lock on account of its location (which is at right angles to the canal) so as to get a gunboat into it with any facility.

The connection with the river at Black Rock will be by lengthening the present ship lock, the width being now ample.

Estimates are made for stone locks, for wood locks, and for locks of wood and stone combined. The stone locks to be of the same character of work as that now in use in the enlarged locks of the Erie canal, which are built of large well dressed limestone laid in hydraulic mortar. In a wise policy, stone is the material which should form the principal part of the locks upon the canals of the State. The quarries are well distributed along the line of the canals, and the limestone is of a good quality, being durable

and easy of access. It lies in regular courses of sufficient thickness for massive masonry, is easily quarried and readily worked. It stands the severity of the climate, and when laid in hydraulic cement, forms a masonry impervious to leakage.

With such materials at hand, nothing is gained by combining wood with stone in the construction of a lock intended for the business of the Erie canal. Stone is durable, while wood is perishable. That portion of the wood at least which is exposed to the weather soon loses its strength, and in a short period decays. It is subject to frequent concussion by heavy boats, and soon requires renewal.

It may be and is good policy to combine wood with stone in locks on some of our lateral canals where the stone is too thin to be profitably dressed or the quality inferior for the purpose required. Such walls laid up in rubble masonry with this class of stone require a few timbers placed vertically in the side walls to prevent boats from coming in contact with the rough face of the masonry.

The business on the lateral canals, when compared with the Erie is small; the boats are of much less size and the number passing is far less. Consequently the timber is not so much exposed to be damaged, and when out of repair it can be renewed without much delay to navigation. Locks built entirely of wood are admissible and proper in small lifts for slack water navigation on our streams, where small craft is used and a moderate business done. It is often good policy to build them where a new line of canal is in process of construction in a forest, where the quality of the stone has not been fully tested, or where its distance from the work makes it too expensive to haul. Even in these cases the timber along the line ought to be used, although it may not be as good as that found at a greater distance. In short, the work and the materials should correspond with the circumstances of the place.

The idea of constructing wood locks on the Erie canal is a grave error. All improvements on this canal are made for facilitating transportation; incidentally they may render it available for war purposes. This line of water communication is not a transient affair, but is directly associated with the wealth and the prosperity of our country. It is one of the great channels through which the commerce of the nation is to pass. The structures of necessity require to be permanent and durable, and built in such a manner as not to be liable to get out of repair, so as to delay, obstruct, or

interfere with a regular and uniform navigation. Any slight advantage that may seem to be gained by building cheap and frail structures, which are frequently demanded by the ardent and sanguine for immediate use, will only end in disappointment.

The short curve at the east end of the Rochester aqueduct makes it impracticable to pass gunboats. Provision is made in the estimate to take down the masonry and extend the arches of one aqueduct and two culverts, thereby widening the canal and lengthening the curve.

Estimates in detail are herewith submitted for three kinds of locks, and for each of the other structures and improvements connected with the locks, including land damages. Maps showing the location of all the structures are also submitted.

The cost of the improvements on the western division of the Erie canal with stone locks is estimated at	$3,273,200 00
By using and enlarging the south double lock at Macedon, leaving out the new towing-path new change bridge, and keeping the channel of canal of its present width, instead of building an entire new lock, this sum may be reduced to	46,500 00
Leaving the estimate at	$3,226,700 00
Again, by following the present line of canal in Lockville, and building a new lock by the side of each of the present three locks, instead of following the new line, the cost will be increased about	$30,000 00
The cost with locks built of wood and stone combined (except at Lockport and extension of ship lock at Black Rock, where the estimate for stone is retained), following the line in the first statement above, is estimated at	2,995,400 00
The cost with wood locks (except at Lockport and extension of ship lock, for which the estimate for stone locks is retained, and excepting the two guard locks for which the estimate for composite locks is retained) on the line contained in the first statement above, is estimated at	$2,960,700 00

Respectfully yours, &c.,

ORVILLE W. STOREY,

Engineer Western Division.

SUMMARY OF WESTERN DIVISION.

NUMBER OF LOCK.	Lift.	Stone locks.	Wood locks.	Wood and stone locks.	Enlarging aqueduct.	New culvert and race.	Bridges.
53	5	$73,030 00	$60,558 00	$60,819 00	.....	.....	.....
54	7½	78,643 00	62,945 00	63,874 50	.....	.....	.....
55	6	76,150 00	61,897 50	63,052 00	.....	.....	$9,158 50
56	10	88,402 50	67,965 00	70,608 50	.....	.....	1,808 00
Combined locks at Lockville, 57-59—two locks	12 each,	197,890 00	159,200 00	159,200 00	.....	$2,148 00	28,576 00
60	10	82,625 00	61,767 50	64,831 00	.....	.....	.....
61	7	82,860 00	66,550 00	68,544 50	.....	.....	4,880 50
62	9	74,182 00	54,675 50	57,877 00	.....	.....	.....
63	9	78,132 00	58,252 50	65,880 00	.....	.....	3,660 00
64	10	88,734 00	68,592 50	70,918 00	.....	.....	.....
65	10	83,106 50	62,047 00	65,290 50	.....	.....	.....
66	9	86,089 50	69,527 00	69,570 00	$66,824 00	.....	.....
Combined locks at Lockport, 67-71—3 locks, each	18 6-10	386,880 00	386,880 00	386,880 00	.....	48,050 00	27,800 00
Sulphur Spring guard lock	.....	50,651 50	40,882 50	40,882 50	.....	.....	.....
River lock at Tonawanda	4	84,643 00	68,395 00	72,065 50	.....	.....	.....
Black Rock guard lock	.....	70,773 00	61,114 00	61,114 00	.....	.....	.....
Ship lock at Black Rock	.....	20,928 50	20,928 50	20,928 50	.....	.....	.....
Totals	.....	$1,703,721 00	$1,432,177 50	$1,462,355 50	$66,824 00	$50,198 00	$75,883 00

NOTE.—No estimates are made for wood locks at Lockville, it being impracticable to build them, as the lifts are so high. No estimates are made for wood locks at the guard locks, as there is to be a feed way in rear of one wall in each case. At Lockport only an estimate for stone locks is made, as the lifts are so high that the most substantial work is required. The estimate for ship lock at Black Rock is also for stone only, as it merely contemplates the extension of good masonry now in use.

GENERAL SUMMARY OF THE WESTERN DIVISION.

ITEMS.	Stone locks.		Wood locks.		Wood and Stone locks.	
	Amounts.	Totals.	Amounts.	Totals.	Amounts.	Totals.
From lock No. 53 to Lake Erie	$1,703,721 00		$1,432,177 50		$1,462,355 50	
Enlarging aqueducts	66,824 00		66,824 00		66,824 00	
New culverts and race	50,198 00		50,198 00		50,198 00	
Bridges	75,882 00		75,882 00		75,882 00	
		$1,896,625 00		$1,625,081 50		$1,655,259 50
A set of middle gates for each of thirteen locks	$26,000 00		$26,000 00		$26,000 00	
Taking out bench and putting slope wall to bottom of canal	83,845 00		83,845 00		83,845 00	
		109,845 00		109,845 00		109,845 00
Engineering and contingencies	$316,330 00		$275,373 50		$279,895 50	
Land damages and removal of buildings at Lockport	60,000 00		60,000 00		60,000 00	
Land damages and removal of buildings at all other places	34,800 00	411,130 00	34,800 00	370,173 50	34,800 00	374,695 50
Total cost		$2,417,600 00		$2,105,100 00		$2,139,800 00
Deepening canal		$855,600 00				

APPENDIX B.

Report up to October 1st, 1865.

To Hon. F. A. Alberger, Canal Commissioner:

EXTRAORDINARY REPAIRS.

Work done on extraordinary repairs during the year, was on work which had been put under contract or adopted by the Canal Board in the preceding year.

The present condition of the work which was under progress on the 1st of October, 1864, is found as follows:

Two culverts near Holly, on repair section No. 12, Erie canal, were extensively repaired last winter, with the intention of making them safe, and a bank at Shelby Basin culvert which had been deemed to be hazardous, was overhauled last winter and made more perfect and safe.

The sewers in the villages of Newark and Albion which were under contract, have been completed according to the plans, and the accounts settled up.

No work has been done on section No. 212, since last annual report, and none done on the nine sections between Brockport and Lockport, all of which were then under contract. Section No. 212, and sections No. 312 and 315, have since been canceled under resolution of Canal Board.

The sewer in the village of Clyde has also been canceled, under resolution of the Canal Board; very little work has been done on it since the last year's report.

The improvement of the Oak Orchard creek and Tonawanda feeders has been in progress.

The sections of heavy work, five in number, between Black Rock and Tonawanda have been under progress during the year. Considerable work done on some of them, and one section, No. 363, has been completed and final account made out.

Increased prices have been allowed by the Canal Board on the work embraced in contracts for sewer in village of Clyde, Oak Orchard creek feeder and sections No. 361, 362, 363, 364, 365 and 366, under acts of the Legislature of 1865.

The banks of the canal were made more secure at some seven different places, on repair section No. 10, by placing stone on the outside in the fall of 1864, for the culvert east of Lyons, to a point one mile west of Port Gibson, and during the early part of the present season a portion of a light tow path bank east of Lock Berlin on the same section, was raised, widened and strengthened, and the slope wall completed at an expense for the two last mentioned works of about $8,400.

A channel for a small creek near the old canal at Holley, has been made by forming an embankment on one side so as to prevent the flow through a borrow pit, from which earth was taken to repair the break in the old canal.

A sluice was also put under the road in the same borrow pit, so as to leave the highway in as good condition as it was before the earth was taken.

The banks were secured at several points between Brockport and Eagle Harbor, by placing stone on the outside during the latter part of 1864.

The amount expended on the channel sluice, securing banks and making culverts safe on repair section No. 12, amounts to some $5,700.

During the present summer the towing-path bank east of Fish creek culvert, on the same repair section, has also been secured with stone, placed in the rear, at the cost of about $940.

In the Erie basin at Buffalo, the bottom was dredged for a short distance, in the fall of 1864, next the dock, to deepen the channel so as to permit vessels to lay alongside and unload.

A draw-bridge for the towing-path has been constructed over the Skayoquada creek, at Pratt & Co.'s iron works, Black Rock, at an expense of about $3,600. It was built in place of a float-bridge which had poorly provided a passage for towing horses for several years, and cheaply connecting with the banks at the ends. It is over a creek in which vessels pass in to unload freight.

The importance of completing the sections between Black Rock and Tonawanda has so often been set forth, that nothing further need be said.

Notwithstanding the embarrassments of high prices for labor

and materials, and difficulties arising from storms to which it is exposed from the lake, the deep frosts, and from the drainage waters from the lands which almost wholly pass into the canal, the work since the letting has progressed steadily towards completion.

The work under contract is to excavate the channel to the bottom of canal, make the towing-path walls, raise up and gravel the towing-path. No work is included to finish up the side opposite the towing-path. This can be left to be done whenever it may tend to slide into the canal.

As before mentioned the Legislature of 1865, passed an act giving authority to the Canal Board to raise the price of the work, but no funds were provided for the increase.

The money required amounts to the sum of $77,000.

Three contracts are still in existence for excavating earth and rock in bottom of canal—one of three miles at Hindsburgh and Hulburton, east of Albion, and the other at Medina, extending west.

The work in the first named should be done without any delay. It is on the sections where boats first find the ground in any casualty that causes low water.

The work done as extraordinary repairs on the Genesee Valley canal were confined to Oil creek and to Ischua creek reservoir, under act, chapter —, laws of 1863, and consisted in raising and widening the roads which were expected to be flooded or washed away in consequence of raising the waters.

Repairs of Erie Canal.

Graveling towing-path has been done on repair sections No. 10, 11 and 12.

Lockgates have been strengthened on repair section No. 10 and secured.

Some of the upper mitre sills protected with iron (railroad rails), against damage by bumping boats, and several of the cast iron valves have been changed and a valve lighter and easier handled substituted therefor.

The weighlock cradle in Rochester weighlock has been overhauled at an expense of $2,300—defective and damaged timbers replaced with new; heavy bars of iron placed under the cross-timbers, extending the whole length of the cradle, and the suspension rods changed, lengthened and extended through the side, with a nut screwed up to the under side of iron bar.

The new suspension rods were made larger than the old.

The weigh lock was brought into use in spring, 1851, and for the tonnage of boats then in use the cradle and suspension rods were perfectly safe. But after the draft of boats were increased to five and six feet depth, the suspension rods and chains occasionally broke, causing delays in its use, consequently permitting the boats to pass without being weighed.

The outside part of the suspension rods, which were in the water, were much corroded, consequently the best part of the iron was weakened. [In this connection I will mention that the center of bars and rods of rolled iron is not so tenacious, compact and strong as the outside. The difference depending much on size of rods.]

A heavy protection wall laid in water lime has been constructed this season at the south west end of towing-path change bridge, on the side of a mill race, in place of a light wall, built without mortar, which had previously failed, and the remaining part of the dry wall protected by a mortar wall in front at an expense of nearly $6,000.

It requires an expenditure of $1,800 to build the remaining part of the wall so as to be permanent, which should be done without any delay.

Work has been done to the amount $3,200 in the State yard at the weigh lock, to put it in a proper condition.

At the high bank five miles west of Rochester, between four and six miles groceries, some twelve chains of the slope wall was taken up before the opening of navigation last spring, and the face of the bank filled in with earth twelve feet wide. Some twelve chains more should be done before the opening of navigation next spring, and the slope wall rebuilt on the part where the bank was put in last spring.

This bank has been a source of uneasiness for several years, since the water has increased in depth and heavy expense to protect it and keep it safe.

The north end of the tier in Fish creek culvert, repair section No. 12, failed by wearing away the rock bottom on which it rests. The rock also wore away under the face of the abutment for some forty feet in north end. The tier has been repaired and the abutments have been underpinned.

The space between the walls has been planked over and spiked to timbers, which are bolted fast to the rock below, filled in and leveled up with concrete.

The bank of the old canal at Holly, next the heavy break, has been strengthened.

The waste gates at Middleport, on repair section No. 13, have been rebuilt and the valves changed.

The dam at Tonawanda has been secured and a change in the plan of working the gates in the bulkhead has been made.

Breaks.

The great break in the Oxbow embankment, November 25th, 1864, on repair section No. 11, was repaired during the winter, and the expense paid to the contractor, under act chap. 490, Laws of 1865.

The unprecedented high floods in spring of 1865 caused the heavy breaks of March 17th.

Works on repair section No. 11, at Rochester, including the feeder, to the amount of $13,540, have been estimated done, subjecting the State to the payment of $4,770, as its moiety of the half of the expenses over $4,000.

The repairs are not entirely completed, therefore the final expense is not made up.

On repair section No. 13 the damage was comparatively slight, besides damage by washing the towing-path and filling deposits into the canal.

The bridge abutments on the towing-path side of canal at Sulphur Spring guard lock was undermined, requiring an expense of $1,090 to reconstruct—done by placing the masonry on a deeper foundation.

The damage was most disastrous at Tonawanda, on repair section No. 14.

Notwithstanding the heavy repairs required, the canal was ready for navigation on the first of May.

Bridges.

The superstructure of several road bridges, built of wood, have failed during the year and have been reconstructed.

GENESEE VALLEY CANAL.

On Repair Section No. 1.

One waste weir on the York Level was again brought into use by building a breast wall of stone masonry, or drop, at the lower ends of the wings, and the past summer two other waste weirs,

one at Keysorville and the other at Piffardinia, were put in order in the same manner. A portion of the wings were also reconstructed.

Breast walls of masonry, forming drops, were also built at the lower ends of three culverts in 1865, two between Mount Morris and the Shakers, and one north of Keysorville, besides completing one in the fall of 1864, which had been previously commenced, to prevent the culverts from being undermined.

The lower end of Buck Run aqueduct was also secured and protected in the same manner.

The wings of the Shaker aqueduct, and the bank at Hartman's creek, were secured and protected.

On repair section No. 2, about one-fourth of the composite locks have been thoroughly repaired by putting in new plate timbers, and replacing the decayed facing plank with new plank.

Early last spring work was commenced to put a bank of earth in place of the North trunk, in Portage, but labor being high and scarce, only a portion has been done, amounting to the sum of about $7,000.

The trunk is not safe, and the work should be commenced early next spring and completed, ready for navigation on the opening of the canals in the spring of 1867.

Breast walls have been made at two waste weirs, like those mentioned on repair section No. 1, one of which, near Burrville, had been out of use some ten years. The other has been kept for use, but in danger of breaking entirely up and washing away.

A spillway, about 340 feet long, was formed over the towing path on the lands of R. G. Bennett, below Nunda. It passes over the towing path, and takes the place of a waste weir, which was carried out in the break of August, 1864, and to be used to pass off the flood waters.

The dam on the Ischua creek, at the head of the Ischua feeder, on repair section No. 3, was lengthened thirty feet last fall. The work, together with the repairs of the break around the dam, amounted to some $4,000, of which the State paid, under the change of plan, nearly $1,900.

During the spring of 1865, piles were driven to protect the banks from the wash of creeks and streams, at some four different places on repair section No. 3. Two spillways were formed to pass the flood waters over the towing path, one of which is at Caseville, on a level into which a creek flows in extreme floods.

The other is near the north end of Cuba Summit, and is to be used in place of the waste weir, which was entirely swept out in the break of March 17th last.

One bridge has been re-constructed over State ditch, near lock 80, under a change of plan.

Several bridges have failed during the year, most of which were on repair section No. 1, and re-built.

The three-track bridge over the feeder at Oramel was re-built before the opening of navigation last spring, and changed into a bridge of two tracks. One track is used for a towing path bridge.

Breaks.

The breaks of August 17th, 1864, were repaired so as to resume navigation, on repair section No. 1, about the 1st of October, and about the 22d over the whole length of repair section No. 2, while No. 3 was also navigable during October.

The breaks of March 17th, 1865, in consequence of the great freshet, were very extensive on repair section No. 1. By washing the towing path, filling the prism of the canal with deposit, breaking away the embankment in a large number of places, and nearly destroyed the Scottsville aqueduct, at which navigation has been sustained with great hazard during the season. The Caneserago Creek aqueduct was also undermined and part of the walls broken down, requiring heavy repairs, and the dam across the Caneserago creek, at the head of the feeder, was undermined in the deep gravel below and partly carried out.

The breaks of March 17th, 1865, on repair section No. 2, were light, compared with those on section No. 1, or as compared with those on section No. 2, in August, 1864; while on repair section No. 3 the great damage done on the 17th of March last was at the north end of the Cuba Summit, which carried out the waste weir and the earth below to the depth of some thirty feet below canal bottom.

Wood Locks.

Locks of Stone in place of Wood Locks.

Five locks, under act chapter 170, Laws of 1864, are under contract, and materials delivered at each. The materials delivered were estimated at $15,760, up to the 1st of October. The locks are to be completed on the opening of navigation next spring. Estimated cost, $70,000.

Three more locks should be let this winter, to be completed on the opening of navigation in the spring of 1867.

RESERVOIR.

The following table shows the time Oil Creek reservoir was deficient in water to keep up navigation, in each year since 1859:

Year.	Detention and time from and to.	Days.
1859.	From September 7th to 21st, and from November 7th to 13th.....	20
1860.	.....	0
1861.	From September 25th to 28th.....	3
1862.	From August 25th to October 24th	60
1863.	From August 3d to November 2d.....	60
1864.	.....	0
1865.	.....	0

There would have been a lack of water for some thirty days in 1864, between the middle of September and the middle of October, had not navigation been suspended on other parts of the canal by breaks.

Act chapter 170, Laws of 1864, provides for taking Lime lake for a reservoir. Surveys and estimates have been made under the direction of the Canal Commissioners, and the maps, plans and estimates have been adopted by the Canal Board.

Nothing further has been done, as funds have not been appropriated for constructing the work.

Lime lake is about one mile long, north and south, and an average of some sixty rods wide, lying in the north part of the town of Machias, in the county of Cattaraugus. It is a part of the head of Cattaraugus creek, consequently its waters flow into Lake Erie, the outlet being from the north end of the lake.

It is contemplated to make the reservoir about one and a half miles long on the surface, by an average of some ninety rods wide, by building a bank at the north end twenty-two chains long, and one across the swamp at the south end seventeen chains long, of sufficient height to raise the water fifteen feet above the present surface of the lake. It is also contemplated to draw the lake eight feet below the present surface.

The reservoirs to be filled from the Ischua creek during the spring floods, also to hold a portion of its surplus in summer freshets. This requires a feeder of one mile long, with a dam four feet high across Ischua creek and a bulkhead, both having abutments of masonry resting on pile foundation.

In order to draw the lake down it requires a channel from the lake to the south bank of the reservoir, a distance of half a mile, and to pass the water from the reservoir for canal purposes, requires a channel extending south one mile from the south bank and discharging into Ischua creek about one and a quarter miles below the dam and bulkhead above mentioned.

The water flows thence down the Ischua creek to the head of the present canal feeder, fifteen miles (road distance).

The surface area of the water in the reservoir, when raised, will be about 270 acres, and the bottom 110 acres, the depth twenty-three feet, containing 195,000,000 cubic feet.

The cost is estimated at $160,000.

Navigation.

Navigation was closed for the season of 1864 on the 8th day of December, by resolution of the Canal Commissioners, and the 1st of May was fixed by the Commissioners for the opening of the canals in the spring of 1865.

The Erie canal was ready on the 1st of May, the day mentioned; but the Genesee Valley canal was not ready its whole length until the 20th of May.

Boats.

Boats navigate the Erie canal built 97½ feet long and 17 feet 8 inches wide; restricted by resolution of the Canal Board to draft not exceeding six feet below the surface of the water. The height above water is likewise restricted so that no part of the boat or load shall exceed 11¼ feet above the surface of the water.

On the Genesee Valley canal scow boats navigate built 78 feet long, 14½ feet wide, and restricted to a draft of three and a half feet in depth below the surface of the water, and no part of the boat or load to exceed nine feet above the surface of the water.

The heavier built boats on the Erie canal weigh seventy-five tons, and the boat and cargo of the largest class weigh 290 tons.

The scow boats on the Genesee Valley canal weigh about thirty tons, and boat and cargo some 110 tons.

Boats built of pine side run about six years without extensive repairs. There is probably no economy in using one of this class for a longer period, where a boat is required for thorough and safe business, for the annual repairs to keep it safe and reliable will be more than one-sixth part of the cost of a new boat.

This class includes the greater part of the boats running on the Genesee Valley canal, and the repair scows belonging to the State or to the contractors.

It may be economy to use one of this class on the repair sections for a longer period, where two or more boats are kept on the same section, one of which has been built within six years, by using the old boat for carrying light loads, tools and kept for repairing up bridges and other mechanical work.

BREAKS AND DETENTIONS.

Erie Canal.

A break occurred in the Oxbow bank on the seventeen mile level, thirteen miles east of Rochester, on the 25th of November, 1864, which put a stop to navigation between Rochester and Cayuga marshes the remainder of the season.

June 28th and 29th, 1865, two lock gates were taken out of the Pittsford locks and replaced by two new gates. Delay of navigation one and a quarter days.

A break occurred through the berme bank, east side of Lock Berlin waste weir. Detention to navigation nearly two days.

July 15th, a boat loaded with corn broke two gates in third lock east of Rochester and sunk. Taking out the wreck and replacing gates detained navigation five days, including filling the locks with water.

September 5th, several timbers on Lyons aqueduct failed, which required the water to be drawn off. Some new timbers were put in three stretches. Navigation suspended two days.

GENESEE VALLEY CANAL.

The breaks on the Genesee Valley canal, caused by the storm of August 17th, 1864, were so far repaired that boats passed its length on the 17th of October.

The portion between Rochester and Dansville was made navigable and used about the first of October; also about twenty-four miles on the main canal from Shakers to Wiscoy feeder.

Navigation continued uninterrupted to the close in December, except two days' detention on account of a break at Scottsville aqueduct.

The breaks of March 17th, 1865, on the Genesee Valley canal, were so far repaired that boats passed through on the 22d of May.

May 25th, a leak at Scottsville aqueduct made it necessary to stop navigation. Detention two days.

June 13th, break near Haskell creek, on the extension, detaining navigation four days.

July 1st to 3d, detention three days, to mow grass in bottom of canal on Piffardinia level, repair section No. 1; and August 3d and 4th, two days' detention for a similar purpose on the Conewangus level.

August 2d, some of the timbers in the bottom of the trunk, upper aqueduct, at Olean, broke, delaying navigation seven days.

August 21st, the two lower lock gates smashed in lock No. 27, at Brushville; the other two gates bady damaged, and the plank on one side of the chamber fell in. At the same time two gates at the lock below were much damaged. Detention six days.

August 24th, the aqueduct at Scottsville failed, which was repaired by extending the trunk south into the earth work. Detention thirteen days.

September 8th, an extensive storm caused breaks the following evening and the next day, over the whole extent of repair section No. 3 and some ten miles along the south end of repair section No. 3. Detention to the end of the month.

WORK IN PROGRESS.

Erie Canal.

The work remaining to be done on the first of October, on work under contract; also moneys required for work done, is shown as follows:

Extraordinary Repairs.

Completing the bottom and towing-path between Black Rock and Tonawanda, under contract	$77,000 00
Excavating bottom embraced in three contracts, (at Hulberton and Medina), including work done between Brockport and Lockport and on section 212, (canceled), at Clyde	25,200 00
Improvement of Oak Orchard creek, under contract	19,000 00
Work done on Clark & Skinner canal	5,300 00
Work done on sewer in Clyde, canceled	2,800 00

Repairs.

Filling inside of towing-path slide bank, between 4 and 6-mile groceries, west of Rochester, and rebuilding slope wall, to be done May 1st, 1866	$7,000 00
Completing a vertical wall west of towing-path bridge, near weigh-lock, Rochester, outside of towing.path, to be done in summer of 1866	1,800 00

GENESEE VALLEY CANAL.

Repairs of Scottsville aqueduct, to be done by 1st of May, 1866	$7,000 00
Repairs of Shaker aqueduct, to be done by 1st of May, 1866	5,900 00
Making bank of earth, secured with stone, on back side, in place of north trunk, Portage, to be done in summer of 1866	19,000 00
Culvert on section No. 66, under act chap. 521, Laws of 1865, now under contract, to be completed April 15th, 1866	1,500 00

The following work is necessary, and should be done without delay:

Reconstruction of Tremont street bridge, in the city of Rochester, on change of plan	$5,000 00
Bringing two waste weirs into use, repairs on change of plan, rep. sec. No. 1	2,000 00
Making a waste weir safe on rep. sec. No. 2	1,000 00
Making waste gate below lock 61, on Portage level, repair sec. No. 2,	1,000 00

Reconstruction of Fillmore bridge over the canal, change of plan by making a roadway and one wide sidewalk to keep up with growth of place, on repair section No. 2	$1,500 00
Raising the towing-path bank at Smith Mills, south of Hinsdale, to prevent the flood waters of Olean creek from flowing into the canal,	1,400 00
Protecting the canal at Cuba against the flood waters of Griffin's creek, repair section No. 3	3,600 00
Making a guard bank from Rapid's lock along side of river to railroad embankment at Rochester, rendered necessary by the late great freshet, repair section No. 1	8,000 00
Making a guard bank from the bulkhead of Caneseraga creek feeder by the side of the creek southerly, to protect the feeder and canal from flood waters, on repair section No. 1	1,300 00

The following work, recommended in report of last year, ought to be done at an early day, some of which cannot be delayed without hazardous risks:

ERIE CANAL.

Raising, enlarging and securing banks	$44,000 00
Taking out bench and constructing slope wall to bottom of canal	95,000 00
Excavating earth from bottom of canal between Cayuga marshes and Clyde	15,000 00
Excavating earth between Macedon and Rochester	5,000 00
Excavating earth and rock from bottom of canal between Rochester and Lockport	100,000 00
Changing plans of bridges	20,000 00
Completing approaches of bridges	21,000 00
Constructing a tier of locks, along side of thirteen single locks, from Cayuga marshes to Rochester, estimated at prices of 1861 and previous years	412,000 00
Constructing guard lock at Sulphur Spring and at Black Rock, along side of single locks	70,000 00
Building lock-houses	6,000 00
Excavating for navigation of Main and Hamburgh street canal at Buffalo	16,000 00
Improvement of Clark & Skinner canal, not embraced under late contract	15,000 00
Dredging out Erie basin, adjoining dock, 300 feet wide	10,000 00
Constructing the Reed culvert, on repair section No. 12, one-half mile west of Eagle Harbor	4,600 00
Covered drain in Lockport, in pursuance of act chapter 420, Laws of 1864	5,000 00
Removing bridge abutments in Lockport, in pursuance of act chapter 473, Laws of 1864	20,000 00
Straightening the berme line of the canal from east approach into weigh-lock, Rochester, easterly to the new towing-path bridge in Griffith street, and constructing the vertical wall	7,300 00

GENESEE VALLEY CANAL.

For making spillways to pass flood waters over the canal on three repair sections	$1,000 00

On Repair Section No. 1.

Improvement at Moscow Landing	$11,000 00
Changing the valves of lock gates to prevent leakage	500 00
Raising and strengthening the slide bank on York level	1,400 00
Widening narrow and raising low banks	1,000 00
Widening channel of canal in cuts at Dumplin Hill and other places,	3,000 00

On Repair Section No. 2.

Making an earth bank, secured with stone in rear, in place of the south trunk at Portage	$12,000 00
Reconstructing bridge at Nunda, under act chap. 482, Laws of 1863	4,650 00
Constructing three stone locks in place of wood lock, not under contract	45,000 00
Constructing lock-houses	1,500 00
Excavating slides into the canal near Portage and Van Buskirks, and protecting against further slides	5,300 00

On Repair Section No. 3.

Widening Ischua feeder and raising and enlarging its banks	$3,000 00
Enlarging and raising towing-path west of Cuba waste weir	2,000 00
Constructing Lime Lake reservoir	160,000 00
Protecting canal at Cuba summit against bars of gravel from Black creek	600 00
Protecting one hundred feet of canal bank against Black creek	800 00
Planking face of pile bents in Olean creek, lower aqueduct	200 00

ORVILLE W. STOREY,
Division Engineer.

TABLES

ACCOMPANYING THE ANNUAL REPORT OF THE CANAL COMMISSIONERS.

The following is a Schedule of all Repair Contracts let in pursuance of act, chap. 105, *Laws of* 1857, *to the present time, and shows the commencement of the several terms, the canal or section embraced in the contracts, the duration of each term, the annual compensation to the contractor, and the several amounts of cash deposits as security for the performance of the contracts.*

Commencement of term.	Canal and section.	Duration of term.	Annual compensation.	Cash security.	Remarks.
February 1, 1859	Oswego, section 2	3 years	$12,899		Expired February 1, 1862.
February 1, 1859	Chemung and feeder	do	13,475		do do
February 1, 1859	Chenango, section 3	do	4,900		Abandoned March 5, 1861.
February 1, 1859	Erie, section 9	do	4,995 750		do do
February 1, 1859	Erie, section 7	do	2,473		Abandoned February 28, 1861.
April 1, 1859	Cayuga and Seneca	do	3,574		do March 15, 1861. [doned Oct. 14, 1861.
May 1, 1859	Genesee Valley, section 1	do	4,800		And 9 cents per cubic yard for excavation; aban-
May 1, 1859	Genesee Valley, section 3	do	4,389		Abandoned March 8, 1860.
May 1, 1859	Erie, section 10	do	6,190		do May 1, 1859.
May 1, 1859	Erie, section 12	do	3,453		do February 4, 1862.
May 1, 1859	Erie, section 13	do	5,495		do December 19, 1860.
May 1, 1859	Champlain, section 1	do	8,973		do April 2, 1860.
May 1, 1859	Champlain, section 2	do	6,800		do do
May 1, 1859	Champlain, section 3	do	5,350		do do
May 1, 1859	Erie, section 2	do	7,900		do October 8, 1859.
May 1, 1859	Erie, section 3	do	7,440		Expired May 1, 1862.
May 1, 1859	Erie, section 4	do	8,849		do do
May 1, 1859	Erie, section 5	do	2,995		Abandoned August 20, 1859.
May 1, 1859	Oswego, section 1	do	2,800		Expired May 1, 1862.
October 1, 1859	Erie, section 10	do	7,800		Abandoned October 8, 1859.
October 1, 1859	Erie, section 11	do	8,280		Expired October 1, 1862.
March 1, 1860	Erie, section 14	do	14,500		do March 1, 1863.
October 1, 1859	Erie, section 8	do	7,000	$2,000	do do
November 1, 1859	Improvement of Black river	5 years	3,800	2,000	
March 4, 1860	Erie, section 1	3 years	28,440	4,000	do March 4, 1863.
March 4, 1860	Erie, section 2	do	9,700	2,000	do do
March 4, 1860	Erie, section 5	do	5,890	2,000	do do
March 4, 1860	Erie, section 10	do	9,430	2,000	do do
August 1, 1860	Champlain, section 1	5 years	8,659	2,000	Abandoned June 1, 1862.

August 1, 1860	Champlain, section 2	do	9,300	2,000	
August 1, 1860	Champlain, section 3	do	4,300	2,000	Abandoned May 26, 1863.
August 1, 1860	Genesee Valley, section 3	do	7,433	2,000	
October 1, 1860	Oneida Lake and feeder	do	2,375	2,000	
October 1, 1860	Crooked Lake	do	3,869	2,000	
October 1, 1860	Chenango, section 1	do	11,500	2,000	Abandoned March 5, 1861.
October 1, 1860	Chenango, section 2	do	5,600	2,000	
March 1, 1861	Black River, section 2	do	4,178	2,000	
March 15, 1861	Erie, section 13	do	9,800	4,000	
March 15, 1861	Genesee Valley, section 2	do	12,540	3,000	
May 1, 1861	Erie, section 7	do	3,490	4,000	
May 1, 1861	Erie, section 9	do	7,000	4,000	
May 1, 1861	Black River, section 1	4⅔ years	8,700	4,000	
May 1, 1861	Chenango, section 1	5 years	13,990	4,000	
May 1, 1861	Chenango, section 3	do	7,000	4,000	
June 1, 1861	Cayuga and Seneca	4 years	4,490	4,000	Abandoned April 15, 1862.
May 1, 1862	Erie, section 3	4⅔ years	10,900	4,000	Abandoned July 21, 1863.
May 1, 1862	Erie, section 4	do	12,780	4,000	
November 1, 1862	Erie, section 8	4+ years	4,940	4,000	
November 1, 1862	Erie, section 11	do	11,900	4,000	
April 1, 1862	Erie, section 12	4⅔ years	6,700	4,000	
October 1, 1862	Champlain, section 1	4⅔ do	13,848	4,000	
May 1, 1862	Oswego, section	4⅔ do	9,000	4,000	
May 1, 1862	Oswego, section 2	4⅔ do	11,900	4,000	Abandoned March 30, 1865.
July 1, 1862	Cayuga and Seneca	4⅔ do	9,950	4,000	
April 1, 1862	Chemung and feeder	4⅔ do	15,960	4,000	
February 1, 1862	Genesee Valley, section 1	5 do	8,472	4,000	
March 4, 1863	Erie, section 1	3¾ do	39,900	4,000	
March 4, 1863	Erie, section 2	do	14,500	4,000	Abandoned March 24, 1865.
March 4, 1863	Erie, section 5	do	4,483	4,000	
March 4, 1863	Erie, section 10	do	11,960	4,000	
March 1, 1863	Erie, section 14	do	14,400	4,000	
August 1, 1863	Champlain, section 3	do	7,500	4,000	
March 1, 1865	Black River improvement, section 3	3 10-12 years	9,750	4,000	
March 1, 1865	Erie, section 8	do	6,500	4,000	
October 1, 1865	Erie, section 2	3¼ years	17,740	4,000	
October 1, 1865	Genesee Valley, section 2	do	17,000	4,000	
October 1, 1865	Genesee Valley, section 3	do	9,990	4,000	
October 1, 1865	Oswego, section 2	do	21,000	4,000	
October 1, 1865	Crooked Lake	do	6,990	4,000	

The following is a Schedule of Repair Contracts, with the percentage allowed in pursuance of act, chap. 252, *Laws of* 1864, *and the sections relet in pursuance of act, chap.* 105, *Laws of* 1857 *which were abandoned Aug.* 1, 1864.

Commencement of term.	Canal and section.	Duration of term.	Original annual compensation.	Percen'e allowed.	Annual compensation including percentage.	Abandoned.
March 4, 1863.....	Erie canal, section 1.....	3¾ years	$39,960 00	72	$68,628 00	
	do 2.....	.....	14,500 00	61	.....	August 1, 1864.
	do 4.....	.....	12,780 00	65	.....	do
	do 5.....	.....	4,483 00	70	.....	do
May 1, 1861.....	do 7.....	5 years	3,490 00	62	5,653 80	
	do 8.....	.....	4,940 00	60	.....	September 22, 1864.
May 1, 1861.....	do 9.....	5 years	7,000 00	61	11,270 00	
March 4, 1863.....	do 10.....	3¾ years	11,960 00	62	19,375 20	
Nov. 1, 1862.....	do 11.....	4 years	11,900 00	60	19,040 00	
April 1, 1862.....	do 12.....	4¾ years	6,700 00	51	10,117 00	
	do 13.....	.....	9,800 00	70	.....	August 1, 1864.
	do 14.....	.....	14,400 00	70	.....	do
April 1, 1862.....	Chemung canal, section 1.....	4¼ years	15,960 00	60	25,536 00	
May 1, 1861.....	Chenango canal, do 1.....	4⅝ years	13,990 00	50	20,985 00	
	do do 2.....	.....	5,600 00	50	.....	do
May 1, 1861.....	do do 3.....	5 years	7,000 00	53	10,710 00	
October 1, 1860.....	Oneida Lake, do 1.....	do	2,375 00	.....	2,375 00	
May 1, 1862.....	Oswego canal, do 1.....	4⅜ years.....	9,000 00	35	12,150 00	
May 1, 1862.....	do do 2.....	do	11,900 00	50	17,850 00	
July 1, 1862.....	Cayuga and Seneca, section 1.....	4¼ years.....	9,950 00	41	14,029 50	
October 1, 1860.....	Crooked Lake canal, do 1.....	5 years	3,869 00	55	5,996 95	
	Genesee Valley canal, do 1.....	do	8,472 00	60	.....	August 1, 1864.
	do do 2.....	do	12,540 00	60	.....	August 15, 1864.
August 1, 1860.....	do do 3.....	do	7,433 00	50	11,149 50	
	Champlain canal, do 1.....	4¼ years	13,848 00	60	.....	August 1, 1864
August 1, 1860.....	do do 2.....	5 years	9,300 00	60	.....	do
August 1, 1863.....	do do 3.....	3¾ years	7,500 00	60	12,000 00	
May 1, 1861.....	Black River canal, do 1.....	4⅜ years	8,700 00	50	13,050 00	
March 1, 1861.....	do do 2.....	5 years	4,178 00	50	6,267 00	
Nov. 1, 1859.....	Black River improvement, section 1..	do	3,800 00	50	5,700 00	

		Contract Let.			Annual compensation.
October 1, 1864	Erie canal, section 2	3½ years			$18,000 00
do	do 3	do			16,780 00
do	do 4	do			22,900 00
do	do 5	do			12,000 00
do	do 13	do			14,400 00
do	do 14	do			24,970 00
do	Chenango, 2	do			16,400 00
do	Genesee Valley, 1	do			19,400 00
do	Champlain, 1	do			25,800 00
do	do 2	do			19,400 00
March 1, 1865	Black River improvement, section 3	3 10-12 years			9,750 00
do	Erie, section 8	do			6,500 00
October 1, 1865	do 2	3½ years			17,740 00
do	Genesee Valley, section 2	do			17,000 00
do	do 3	do			9,990 00
do	Oswego, section 2	do			21,000 00
do	Crooked Lake	do			6,990 00

STATEMENT *showing amounts expended by superintendents of repairs and paid repair contractors, and average cost per mile, on each and all canals, from* 1827 *to* 1865 *inclusive.*

YEARS.	ERIE AND CHAMPLAIN CANALS.		OSWEGO CANAL.		CAYUGA AND SEN. CANAL.		CHEMUNG CANAL.		CROOKED LAKE CANAL.	
	Cost of repairs.	Av'ge per mile.	Cost of rep's.	Av. per mile.	Cost of rep's.	Av. per mile.	Cost of rep's.	Av. per mile.	Cost of rep's.	Av. per mile.
1827	$232,472	$528	.....	.....	.....	.....	.....	.....	.....	.....
1828	225,846	513	$8,637	$329	.....	.....	.....	.....	.....	.....
1829	232,931	529	13,003	361	$8,499	$386	.....	.....	.....	.....
1830	202,968	461	12,500	349	5,477	247	.....	.....	.....	.....
1831	168,240	382	9,170	254	3,363	152	.....	.....	.....	.....
1832	327,302	743	12,259	340	5,356	243	.....	.....	.....	.....
1833	328,585	746	11,295	313	8,243	374	$24,666	$666	.....	.....
1834	429,659	976	12,181	338	8,832	401	25,639	692	$2,653	$331
1835	392,921	893	16,327	453	9,685	440	9,616	259	3,556	454
1836	310,183	704	51,637	1,434	29,898	1,358	9,665	261	4,739	592
1837	365,406	830	57,908	1,608	28,539	1,297	14,569	393	6,214	776
1838	374,713	851	49,360	1,371	18,994	861	13,394	364	4,454	556
1839	297,722	676	24,463	679	23,397	1,063	13,302	361	3,557	443
1840	364,292	827	34,796	915	24,740	1,124	12,401	335	4,501	562
1841	255,687	581	26,406	694	13,940	633	23,360	631	9,034	1,129
1842	322,354	732	31,427	827	15,829	719	34,524	933	8,113	1,014
1843	297,614	676	23,678	623	10,938	497	14,295	386	4,047	505
1844	371,449	844	28,598	752	14,442	656	12,703	344	3,951	493
1845	399,094	907	46,639	1,227	14,191	645	17,978	485	4,765	595
1846	371,185	843	53,546	1,409	12,325	560	14,264	385	5,309	663
1847	380,388	864	39,551	1,040	14,192	645	15,917	430	5,890	736
1848	503,953	1,145	72,783	2,021	13,009	591	27,232	736	8,516	1,064
1849	395,681	899	32,792	868	11,824	537	24,306	657	10,296	1,287
1850	478,887	1,085	31,805	837	10,831	492	33,230	852	5,620	905
1851	437,458	972	31,045	817	20,576	895	37,741	968	5,319	665
1852	558,329	1,232	42,728	1,124	27,606	1,200	32,620	836	7,751	969
1853	575,777	1,271	38,026	1,000	17,421	680	24,366	625	4,932	616
1854	677,270	1,543	86,529	2,277	17,025	680	30,653	786	5,132	641
1855	505,608	1,154	59,192	1,448	12,880	560	22,853	560	4,316	539
1856	454,865	1,031	59,854	1,574	9,364	448	17,209	441	3,647	456
1857	458,742	1,035	78,017	2,053	13,234	575	87,314	2,238	4,447	556

1858	435,916	973	107,698	2,834	21,769	946	105,605	8,862	9,803	1,125
1859	446,746	999	48,263	1,269	5,850	234	21,965	563	4,849	606
1860	229,008	526	15,639	412	3,492	159	12,431	319	4,598	575
1861	206,952	476	25,552	672	19,284	876	23,455	601	6,186	773
1862	240,650	533	31,191	725	19,059	657	27,024	692	7,557	933
1863	323,625	744	29,090	765	11,829	537	80,583	20,066	5,142	643
1864	519,505	1,194	27,414	721	14,973	681	29,141	747	23,697	2,962
1865	816,660	1,877	238,622	6,279	19,965	907	88,398	2,266	36,206	4,525

Statement of Superintendents' expenditure—Continued.

YEARS.	CHENANGO CANAL.		GENESEE VALLEY CANAL.		ONEIDA LAKE CANAL.		BLACK RIVER CANAL.		ONEIDA RIVER IMPROVEMENT. B. V. CANAL.		Total miles.	Total cost of repairs.	Total average per mile.
	Cost of repairs.	Average per mile.	Cost of repairs.	Average per mile.	Cost of repairs.	Average per mile.	Cost of repairs.	Average per mile.	Cost of repairs.	Average per mile.			
1827	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	400	$232,473	$528
1828	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	478	234,433	490
1829	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	500	254,433	509
1830	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	500	221,005	442
1831	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	500	180,773	361
1832	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	500	344,917	690
1833	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	537	372,789	694
1834	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	545	478,964	879
1835	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	545	432,118	793
1836	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	545	406,122	745
1837	$19,509	$201	.....	.....	.....	.....	.....	.....	.....	.....	642	492,144	766
1838	10,809	214	.....	.....	.....	.....	.....	.....	.....	.....	642	481,774	750
1839	17,248	177	.....	.....	.....	.....	.....	.....	.....	.....	642	379,769	591
1840	15,427	159	$4,529	$125	.....	.....	.....	.....	.....	.....	694	460,686	664
1841	15,563	160	10,460	290	$3,370	$561	.....	.....	.....	.....	700	357,828	511
1842	18,955	195	17,749	341	3,608	601	.....	.....	.....	.....	700	452,559	646
1843	15,062	155	15,210	292	2,232	372	.....	.....	.....	.....	700	383,076	547
1844	15,959	164	15,556	299	1,636	272	.....	.....	.....	.....	700	464,329	663
1845	18,951	195	16,901	325	1,933	322	.....	.....	.....	.....	700	520,452	743
1846	18,452	190	17,399	334	17,875	2,979	.....	.....	.....	.....	700	510,355	729
1847	18,859	194	15,782	303	5,842	973	.....	.....	.....	.....	700	496,424	709
1848	20,901	215	26,577	510	1,855	309	.....	.....	.....	.....	700	674,777	964
1849	25,888	267	18,183	350	1,160	390	.....	.....	.....	.....	700	521,122	744
1850	27,189	280	18,575	357	4,892	815	$15,508	$398	$412	$21	762	626,950	823
1851	29,832	307	32,938	383	3,591	449	21,516	448	2,250	112	817	722,259	762
1852	36,730	375	79,587	904	6,360	1,060	30,731	667	2,084	104	887	824,533	929
1853	38,243	394	55,766	634	6,766	770	26,830	488	1,554	78	887	789,082	901
1854	49,187	507	48,093	546	10,440	1,740	28,548	570	3,255	162	887	960,265	1,082
1855	49,232	486	49,000	415	6,236	1,039	34,000	578	3,706	185	901	781,688	868
1856	13,903	143	34,271	381	2,589	432	17,204	441	2,482	124	901	616,014	684

1857.....	27,826	265	60,650	514	3,119	519	15,179	155	3,591	179	902	752,575		828
1858.....	44,114	455	80,911	686	4,104	586	18,622	190	2,797	140	917	878,721		958
1859.....	26,067	269	46,490	394	3,975	568	24,926	255	1,079	54	917	630,615		688
1860.....	26,934	278	38,518	304	4,059	676	22,287	237	.....	.....	866	356,966		412
1861.....	22,593	233	28,450	224	3,242	540	23,402	249	1,070	89	878	360,187		410
1862.....	29,086	299	64,711	534	2,475	358	23,629	241	450	22	924	342,817		371
1863.....	31,897	328	49,984	393	2,375	395	20,455	217	.....	.....	924	555,052		601
1864.....	40,846	421	166,227	1,309	2,543	424	21,648	230	632	53	.....	846,624		943
1865.....	100,450	1,036	231,902	1,826	2,365	394	48,488	515	499	42	.....	1,584,648		1,765

TABLE

Exhibiting the date of the opening and the closing of the Hudson river, and the number of days open; also the time of commencement and close of each navigable season of canals, and the number of days of navigation since 1824; *also the date of the opening of Lake Erie since* 1827.

OPENING AND CLOSING OF THE HUDSON RIVER.					COMMENCEMENT AND CLOSE OF NAVIGATION OF ERIE CANAL.				
River open.		River closed.		Days open.	Canal open.		Canal closed.		Navigable days.	Opening of the lake.	
March	3, 1824	January	5, 1824	309	April 30, 1824		December	4	219		
do	6, 1825	December	13, 1825	283	do 12, 1825		do	5	238		
February	25, 1826	do	24, 1826	302	do 20, 1826		do	18	243		
March	20, 1827	November	25, 1827	251	do 22, 1827		do	18	241	April	21, 1827
February	8, 1828	December	23, 1828	220	March 27, 1828		do	20	269	do	1, 1828
April	1, 1829	January	14, 1829	286	May 2, 1829		do	17	230	May	10, 1829
March	15, 1830	December	25, 1830	283	April 20, 1830		do	17	242	do	5, 1830
do	15, 1831	do	6, 1831	262	do 16, 1831		do	1	230	do	8, 1831
do	25, 1832	do	21, 1832	289	do 25, 1832		do	21	241	April	27, 1832
do	21, 1833	do	13, 1833	277	do 19, 1833		do	12	238	do	23, 1833
February	29, 1834	do	15, 1834	291	do 17, 1834		do	12	240	do	6, 1834
March	25, 1835	November	30, 1835	268	do 15, 1835		November	30	230	May	8, 1835
April	4, 1836	December	7, 1836	248	do 25, 1836		do	26	216	April	27, 1836
March	27, 1837	do	14, 1837	261	do 20, 1837		December	9	234	May	16, 1837
do	19, 1838	November	25, 1838	257	do 12, 1838		November	25	228	March	31, 1838
do	25, 1839	do	18, 1839	286	do 26, 1839		December	16	241	April	11, 1839
February	25, 1840	do	5, 1840	285	do 20, 1840		do	9	228	do	27, 1840
March	24, 1841	do	19, 1841	286	do 24, 1841		November	30	221	do	14, 1841
February	4, 1842	do	28, 1842	308	do 20, 1842		do	28	222	March	7, 1842
April	13, 1843	December	10, 1843	242	May 1, 1843		do	30	214	May	6, 1843
March	18, 1844	do	17, 1844	278	April 18, 1844		do	26	222	March	14, 1844
February	24, 1845	do	3, 1845	283	do 15, 1845		do	29	228	April	3, 1845
March	18, 1846	do	14, 1846	275	do 16, 1846		do	25	224	do	11, 1846
April	7, 1847	do	25, 1847	263	May 1, 1847		do	30	214	do	23, 1847
March	22, 1848	do	27, 1848	292	do 1, 1848		December	9	223	do	9, 1848
do	19, 1849	do	26, 1849	286	do 1, 1849		do	5	219	March	25, 1849

March	10, 1850	do	17, 1850	282	April	22, 1850	do	11	234	March	25, 1850
February	25, 1851	do	14, 1851	293	do	15, 1851	do	5	235	April	2, 1851
March	28, 1852	do	23, 1852	270	do	20, 1852	do	16	239	do	20, 1852
do	23, 1853	do	21, 1853	274	do	20, 1853	do	20	245	do	14, 1853
do	17, 1854	do	8, 1854	266	May	1, 1854	do	3	217	do	29, 1854
do	27, 1855	do	20, 1855	268	do	1, 1855	do	10	224	do	21, 1855
April	11, 1856	do	14, 1856	248	do	5, 1856	do	4	214	May	2, 1856
February	27, 1857	do	27, 1857	303	do	6, 1857	do	15	223	April	27, 1857
March	20, 1858	do	17, 1858	273	April	28, 1858	do	8	225	do	15, 1858
do	13, 1859	do	10, 1859	273	do	15, 1859	do	12	242	do	7, 1859
do	6, 1860	do	14, 1860	283	do	25, 1860	do	12	232	do	17, 1860
do	5, 1861	do	23, 1861	294	May	1, 1861	do	10	224	do	13, 1861
April	4, 1862	do	19, 1862	259	do	1, 1862	do	10	224	do	15, 1862
do	3, 1863	do	11, 1863	253	do	1, 1863	do	9	223	do	3, 1863
March	11, 1864	do	12, 1864	277	April	30, 1864	do	8	223	do	13, 1864
do	22, 1865	do	16, 1865	270	May	1, 1865	do	12	226	do	26, 1865

SCHEDULE

Of contracts let by Board of Canal Commissioners under acts, chaps. 327, Laws of 1854, and 554 of 1855, showing the commencement of the several terms, the canal or section embraced in the contract, the duration of each term, and the annual compensation to the contractors.

Commencement of term.	CANAL AND SECTION.	Duration of term.	Annual compensation	Remarks.
October 1, 1854..	Section 8, Erie canal	5 years	$7,370	Expired October 1, 1859
March 1, 1855..	Section 1, Erie canal	do	43,000	March 4, 1860
October 1, 1855..	Section 1, Chenango canal	do	14,700	October 1, 1860
October 1, 1855..	Section 2, Chenango canal	do	6,000	October 1, 1860
October 1, 1855..	Oneida Lake canal	do	3,975	October 1, 1860
October 1, 1855..	Crooked Lake canal	do	4,473	October 1, 1860
January 1, 1856..	Section 1, Black River canal	do	3,999	January 1, 1861
January 1, 1856..	Section 2, Black River canal	do	9,985	January 1, 1861
April 15, 1858..	Addition to section 2, Black river canal. See chap. 185, Laws of 1858	.....	2,000	January 1, 1861
Feb'y 1, 1856..	Section 2, Genesee Valley canal	5 years	13,900	Febru'y 1, 1861

STATEMENT

Of the number, class and tonnage of boats on the canals on the 1st of January, 1844; also the number, class and tonnage of boats built and registered in each year, subsequently to, and including 1862.

Tons.	Prior to Jan. 1, 1844.		1844.		1845.		1846.		1847.		1848.		1849.		1850.		1851.		1852.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
300																				
250																				
240																				
230																				
225																				
220																				
210																				
200																				
195																				
190																				
180																				
175																				
170																	1	170		
160																				
150															2	300			1	150
145																				
140																				
135																				
130													1	130			1	130	2	260
125																	1	125		
120													1	120			2	240		
115																				
110																				
105																				
100													2	200	13	1,303	27	2,700	34	3,400
95					4	95	1	95	6	570			4	380	6	570	33	2,185	63	5,985
90	2	180	1	90	1	360	6	540	27	2,430	10	900	4	360	25	2,250	72	6,480	90	8,100

STATEMENT—Continued.

Tons.	Prior to Jan. 1, 1844.		1844.		1845.		1846.		1847.		1848.		1849.		1850.		1851.		1852.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
85	1	85	.....	.....	1	85	7	595	45	3,825	20	1,785	13	1,105	16	1,360	11	935	22	1,870
80	3	240	9	720	13	1,040	100	8,000	560	44,800	148	11,840	78	6,240	38	3,040	28	2,240	26	2,080
75	14	1,050	33	2,475	60	4,500	186	13,950	553	41,475	158	11,850	75	5,625	17	1,275	22	1,650	10	750
70	175	12,250	124	8,680	107	7,490	123	8,610	162	11,340	59	4,130	20	1,400	20	1,400	18	1,260	9	630
65	295	19,175	94	6,110	54	3,510	26	1,690	44	2,860	13	845	2	130	4	260	1	65	4	260
60	526	31,560	71	4,260	33	1,980	9	540	30	1,800	25	1,500	7	420	3	180	2	120	2	120
55	256	14,080	15	825	4	220	1	55	13	715	8	440	....	.....	....	.....	....	.....	....	.....
50	457	22,850	14	700	5	250	3	150	4	200	2	100	2	100	4	200	1	50	6	300
45	158	7,110	1	45	2	90	1	45	3	135	4	180	....	.....	....	.....	1	45	....	.....
40	148	5,920	.....	.....	.....	.....	3	120	4	160	1	40	....	.....	3	120	1	40	....	.....
35	33	1,155	1	35	1	35	....	.....	3	105	.....	.....	....	.....	....	.....	1	35	....	.....
30	34	1,020	11	330	1	30	2	60	3	90	6	180	4	120	....	.....	....	.....	....	.....
25	10	250	3	75	.....	.....	4	100	3	75	.....	.....	....	.....	....	.....	....	.....	....	.....
20	8	160	.....	.....	3	60	3	60	2	40	.....	.....	2	40	....	.....	....	.....	....	.....
15	3	45	1	15	.....	.....	....	.....	1	15	1	15	....	.....	....	.....	....	.....	....	.....
10	4	40	.....	.....	1	10	2	20	2	30	1	10	....	.....	....	.....	....	.....	2	20
5	.....	.....	.....	.....	4	20	....	.....	.....	.....	.....	.....	....	.....	1	5	....	.....	....	.....
2	.....	.....	.....	.....	3	6	....	.....	.....	.....	.....	.....	....	.....	....	.....	....	.....	....	.....
Totals..	2,127	117,170	378	24,360	297	19,781	477	34,630	1,466	110,665	457	33,765	215	16,370	152	12,260	213	18,470	271	23,925

STATEMENT—Continued.

Tons.	1853.		1854.		1855.		1856.		1857.		1858.		1859.		1860.		1861.		1862.		1863.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
300 ..	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	1	300	....	.....	....	.....
280 ..	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	2	560	....	.....
250 ..	3	750	2	500	....	.....	1	250	1	250	1	250	2	500	2	500	15	3,750	3	750	....	.....
240 ..	1	740	....	.....	1	240	2	480	....	.....	....	.....	....	.....	....	.....	5	1,200	1	240	....	.....
230 ..	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	2	460	2	460	3	690
225 ..	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	12	2,700	28	6,300	2	450
220 ..	1	220	1	220	....	.....	....	.....	....	.....	....	.....	....	.....	3	660	41	9,020	87	19,140	69	15,180
210 ..	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	5	1,050	16	3,360	....	.....
200 ..	5	1,000	3	600	4	800	....	.....	3	600	3	600	4	800	33	6,600	169	33,800	298	59,600	254	50,800
195 ..	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	1	195	2	390	....	.....
190 ..	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	16	3,040	6	1,140	25	4,750
180 ..	....	.....	....	.....	....	.....	4	720	....	.....	7	1,260	12	2,160	60	10,800	36	6,480	11	1,980	70	12,600
175 ..	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	5	875	22	3,850	....	.....
170 ..	....	.....	1	170	....	.....	....	.....	....	.....	15	2,250	7	1,190	17	2,890	3	510	....	.....	8	1,360
160 ..	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	1	160	4	640	9	1,440
150 ..	6	900	13	1,950	2	300	2	300	51	7,650	46	6,900	11	1,650	14	2,100	27	4,050	88	13,200	24	3,600
145 ..	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	1	145	....	.....	....	.....
140 ..	....	.....	....	.....	....	.....	4	560	15	2,100	5	700	1	140	2	280	19	2,660	13	1,820	14	1,960
135 ..	....	.....	....	.....	....	.....	5	675	2	270	....	.....	....	.....	2	270	1	135	2	270	....	.....
130 ..	7	910	9	1,170	43	5,590	22	2,860	16	2,080	4	520	2	260	2	260	3	390	4	520	16	2,080
125 ..	18	2,250	105	13,125	18	2,250	14	1,750	21	2,625	15	1,875	1	125	5	625	8	1,000	1	125	3	375
120 ..	16	1,920	143	17,160	125	15,000	118	14,160	84	10,080	13	1,560	9	1,080	22	2,640	15	1,800	12	1,440	15	1,800
118 ..	10	1,150	34	3,910	17	1,955	13	1,495	4	460	....	.....	....	.....	....	.....	....	.....	7	826	....	.....
115 ..	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	5	575	....	.....	4	460	3	345
110 ..	16	1,760	87	9,570	13	1,430	10	1,100	6	660	3	330	1	110	4	440	5	550	5	550	5	550
105 ..	....	.....	....	.....	....	.....	1	105	2	210	....	.....	2	210	....	.....	1	105	....	.....	....	.....
100 ..	79	7,900	83	8,300	28	2,800	28	2,800	8	800	25	2,500	14	1,400	55	5,500	67	6,700	194	19,400	61	6,100
95 ..	180	17,100	69	6,555	40	3,800	38	3,610	18	1,710	15	1,425	5	475	13	1,235	19	1,805	21	1,995	14	1,330
90 ..	164	14,760	95	8,550	58	5,220	69	6,210	43	3,870	16	1,440	36	3,240	42	3,780	41	3,690	51	4,590	102	9,180
85 ..	22	1,870	20	1,700	16	1,360	3	255	16	1,360	5	425	8	680	35	2,975	25	2,125	1	85	8	680
80 ..	33	2,640	44	3,520	28	2,240	6	480	15	1,200	22	1,760	25	2,000	49	3,920	43	3,440	4	240	18	1,440
75 ..	15	1,125	32	2,400	43	3,225	17	1,275	14	1,050	14	1,050	21	1,575	19	1,425	10	750	2	150	7	525
70 ..	6	420	10	700	23	1,610	4	280	3	210	7	490	16	1,120	4	280	5	350	1	70	10	700

STATEMENT—Continued.

Tons.	1853.		1854.		1855.		1856.		1857.		1858.		1859.		1860.		1861.		1862.		1863.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
65 ...	3	195	1	65	2	130	....	.....	1	55	3	195	4	260	3	195	2	130	....	.....	....	.....
60 ...	2	120	2	120	4	240	....	.....	3	180	18	1,080	8	480	2	120	6	360	....	.....	6	360
55 ...	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	10	550	....	.....	....	.....	....	.....	....	.....
50 ...	3	150	1	50	3	150	1	50	....	.....	7	350	1	50	2	100	2	100	2	100	5	250
45 ...	....	.....	1	45	....	.....	....	.....	....	.....	1	45	3	135	1	45	....	.....	1	45	6	270
40 ...	....	.....	1	40	....	.....	1	40	1	40	3	120	....	.....	1	40	1	40	....	.....	....	.....
35 ...	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	1	35	....	.....	1	35	....	.....
30 ...	....	.....	....	.....	....	.....	....	.....	1	30	....	.....	....	.....	....	.....	....	.....	1	30	9	270
25 ...	....	.....	1	25	1	25	....	.....	....	.....	3	75	....	.....	....	.....	1	25	3	75	....	.....
20 ...	....	.....	....	.....	1	20	1	20	....	.....	....	.....	....	.....	2	40	1	20	1	20	4	80
15 ...	....	.....	2	30	1	15	1	15	....	.....	1	15	1	15	....	.....	....	.....	....	.....	....	.....
10 ...	....	.....	....	.....	....	.....	1	10	1	10	1	10	1	10	2	20	....	.....	....	.....	....	.....
5 ...	....	.....	....	.....	....	.....	....	.....	....	.....	1	5	1	5	1	5	....	.....	2	10	1	5
2 ...	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Totals	590	57,380	760	80,475	471	48,400	366	39,500	329	37,510	254	27,530	206	20,220	403	48,355	615	93,910	902	144,466	771	119,170

N. B.—An allowance must, of course, be made of such boats as have gone out of use.

Accurate accounts were made of the number of boats on the 1st of January, in the years 1847, 1853 and 1859, and resulted as follows:

January 1, 1847, whole number of boats..... 2,275
January 1, 1853, do do 3,401
January 1, 1859, do do 3,867

STATEMENT

Of the number, class and tonnage of boats built and registered in 1864.

TONNAGE.	Steam.	D. boy.	Scows.	Decked scows.	Lake.	Bull heads.	Line.	Total boats.	Total tons.
300	.....	.....	.....	.....	.....	.....	.....	.....	.....
280	.....	.....	.....	.....	.....	.....	.....	.....	.....
250	.....	.....	.....	.....	.....	.....	.....	.....	.....
240	.....	.....	1	.....	.....	.....	.....	1	240
230	.....	.....	.....	1	2	.....	.....	3	690
225	.....	.....	4	1	6	.....	.....	11	2,475
220	.....	.....	5	1	21	3	.....	30	6,600
200	1	.....	25	7	55	10	.....	98	19,600
190	.....	.....	.....	.....	.....	3	.....	3	570
180	.....	.....	4	.....	3	.....	.....	7	1,260
170	.....	.....	.....	.....	.....	.....	.....	.....	.....
160	.....	.....	1	.....	1	.....	.....	2	320
150	.....	.....	8	4	10	2	.....	24	3,600
140	.....	.....	1	3	11	.....	.....	15	2,100
130	.....	.....	.....	1	2	.....	.....	3	390
125	.....	.....	.....	3	1	1	.....	5	625
120	.....	.....	1	2	3	.....	.....	6	720
115	.....	.....	1	1	2	.....	.....	4	460
110	.....	.....	.....	2	.....	.....	.....	2	220
100	.....	.....	1	23	10	4	.....	38	3,800
95	.....	.....	1	29	3	5	.....	38	3,610
90	.....	.....	4	32	8	22	.....	66	5,940
85	.....	.....	.....	1	2	1	.....	4	340
80	.....	.....	1	11	5	2	.....	19	1,520
75	.....	.....	.....	1	.....	.....	.....	1	75
70	1	.....	.....	6	.....	.....	.....	7	490
60	1	.....	3	.....	2	.....	.....	6	360
50	.....	.....	.....	1	.....	.....	.....	1	50
45	1	.....	.....	1	1	.....	.....	3	135
30	.....	.....	.....	.....	.....	.....	.....	.....	.....
25	1	.....	.....	.....	.....	.....	.....	1	25
20	1	.....	.....	.....	.....	.....	.....	1	20
5	.....	.....	.....	.....	.....	.....	.....	.....	.....
	6	.....	61	131	148	53	.....	399	56,235

RATES OF TOLL—1865,

Established by the Canal Board, on persons and property transported on the New York State canals, to take effect on the opening of navigation.

[Toll is to be computed upon the weight ("1,000 pounds per mile") of all articles contained in the following list, unless otherwise stated, opposite to the articles excepted.]

A.

	cts.	m.	fr.
Acid sulphuric	0	2	0
Agricultural implements	0	2	0
Articles not enumerated, going towards tide water	0	3	0
On the same going from tide water	0	1	5
Agricultural productions of the United States, not particularly specified	0	3	0
Apples	0	2	0
Ashes, pot and pearl	0	2	0
Ashes, leached	0	0	5

B.

Bacon	0	1	0
Barley	0	3	0
Barrels, empty, transported in boats	0	1	0
Barrels, empty, transported in rafts	0	5	0
Bars of iron	0	1	5
Barytes	0	3	0
Beans	0	3	0
Bed plates for steam engines (cast iron)	0	2	0
Bedstead stuff (see Lumber No. 3)	0	2	3
Beef, salted	0	2	0
Bloom iron	0	2	0
Boat knees (see Lumber No. 3)	0	2	3
Boats used chiefly for transportation of passengers upon all canals, per mile	4	0	0
On same, if they elect to commute for tolls upon passengers	3	0	0
Boats used chiefly for transportation of property, per mile	2	0	0
On the same, if they elect to commute for tolls upon passengers	2	3	0
Boats registered before July 1st, 1862, whose bows do not conform to regulation No. 40, per mile	3	0	0
Bolts, stave, if carried in boats	0	1	5
Bolts, stave, if carried in rafts	0	5	0
Bones for manure	0	1	0
Bones other than for manure	0	2	0
Boxes, stuff for (see Lumber No. 3)	0	2	3
Bran	0	2	0
Brick	0	1	0
Broom handles (see Lumber No. 3)	0	2	3
Brush backs (see Lumber No. 3)	0	2	3
Brush handles (see Lumber No. 3)	0	2	3
Buffalo skins	0	3	0
Butter	0	2	0
Butts, stave, if carried in boats	0	1	5
Butts, stave, if carried in rafts	0	5	0

C.

Cabinet ware	0	3	0
Carboys	0	2	0
Carts	0	2	0
Car axles	0	2	0
Car wheels (iron)	0	2	0
Carriages and sleighs	0	2	0
Casks, empty, transported in boats	0	1	0
Casks, empty, transported in rafts	0	5	0
Castings, all iron castings, except machines and parts thereof	0	3	0
Castings, broken	0	2	0
Cattle alive	0	2	0
Cedar posts (see Lumber No. 2) per 1000 feet per mile	0	6	5
Cedar, red (see Lumber No. 2) per 1000 feet per mile	0	6	5

	cts.	m.	fr.
Cement, fire-proof	0	2	0
Chairs	0	3	0
Chair stuff (see Lumber No. 3)	0	2	3
Charcoal	0	0	5
Cheese	0	2	0
Cider	0	2	0
Clay	0	1	0
Clover seed	0	4	0
Coal, mineral or anthracite	0	1	0
Coal, bituminous	0	1	0
Coal oil	0	1	0
Coffee	0	1	5
Copper ore	0	1	0
Copper, pig and smelted	0	1	0
Corn	0	2	5
Corn meal	0	2	5
Cotton	0	1	0
Crockery	0	1	5

D.

Deer skins	0	3	0
Demijohns	0	4	0
Domestic distilled spirits	0	2	0
Domestic cottons	0	2	0
Domestic woolens	0	2	0
Dried fruit	0	4	0

E.

Earth	0	1	0
Esculent roots	0	1	0
Enameled ware, flint	0	1	5

F.

Fellies (see Lumber No. 3)	0	2	3
Fire-proof cement	0	2	0
Fire brick	0	1	0
Flax seed	0	2	0
Flint enameled ware	0	1	5
Flour	0	3	0
Furniture, cabinet ware and chairs	0	3	0
Furniture for stoves, not cast iron	0	3	0
Furs, and skins of animals producing furs	0	3	0

G.

Gas pipes	0	1	5
Glass ware	0	1	5
Grass seed	0	4	0
Grease	0	1	5
Gunstocks (see Lumber No. 3)	0	2	3
Gypsum, the product of this State, ground and unground	0	1	5
Gypsum, foreign and the product of other states, ground and unground	0	2	5
Gypsum, calcined	0	2	0

H.

Hand spikes (see Lumber No. 3)	0	2	3
Hay, pressed	0	1	0
Heading, undressed, transported in boats	0	1	5
Heading, dressed or partly dressed	0	1	5
Heading, transported in rafts	0	5	0
Hemp going towards tide water	0	1	0
Hides, green, of domestic animals of the United States	0	3	0
Hides, raw, imported, of domestic and other animals	0	3	0
Hogs alive	0	2	0
Hops	0	2	0
Hop poles (see Lumber No. 3)	0	2	3
Hop poles transported in rafts	0	5	0
Hoop poles (see Lumber No. 3)	0	2	3
Hoop poles transported in rafts	0	5	0
Hoops, rived	0	2	3
Horses	0	2	0
Horses, used exclusively for towing boats and other floats, exempt from toll.			
Horse shoes	0	1	5
Hubs (see Lumber No. 3)	0	2	3

I.

	cts.	m.	fr.
Ice	0	1	0
Iron in sheets, bars and bundles	0	1	5
Iron ore	0	1	0
Iron, bloom, scrap and pig	0	2	0
Iron, boiler	0	1	5
Iron, bridge and railing	0	1	5
Iron bolts	0	2	0
Iron safes	0	2	0

J.

Junk	0	3	0

L.

Lard	0	1	5
Lard oil	0	1	5
Lath (see Lumber No. 1)	0	2	3
Lath (see Lumber No. 2) per 100 feet per mile, surface measure	0	6	5
Lath (see Lumber No. 3)	0	2	3
Lead, pig going towards tide water	0	1	0
Lead, bar, going towards tide water	0	1	0
Leather manufactured	0	1	5
Lime, manufactured	0	1	5
Lime water	0	1	5
Limestone	0	1	0
Looking-glasses	0	2	0
Looking-glass backs (see Lumber No. 3)	0	2	3

LUMBER No. 1.*—*Transported in boats by weight, per* 1,000 *pounds per mile.*

White pine, white wood, cherry, bass wood, cedar, boards, planks, scantling, and on all sidings, lath and other sawed stuff less than one inch thick (except such as is enumerated in Lumber No. 3)	0	2	3
Oak, hickory, beech, Sycamore, black walnut, butternut, maple, ash, elm, fir, tamarack, yew and spruce	0	1	3
Hemlock	0	1	0

LUMBER No. 2.*—*Transported in boats by measurement, per* 1,000 *feet per mile.*

Boards, planks, scantling, railroad ties and sawed timber, reduced to inch measure, and all siding, lath and other sawed stuff, less than one inch thick (except such as is enumerated in Lumber No. 3), tolls computed on surface measure; and all kinds of red cedar, cedar posts, estimating that a cord, after deducting for openings, will contain 1,000 feet	0	6	5
Hemlock, per 1,000 feet per mile, when not weighed	0	3	0
Lumber No. 2, transported in rafts, per 100 feet per mile	2	5	0

LUMBER No. 3.*—*Transported in boats by weight, per* 1,000 *pounds per mile.*

Sawed lath of less than 10 feet in length, split lath, hoop poles, hand spikes, rowing oars, broom handles, spokes, hubs, trenails, fellies, boat and ship knees, plane stocks, pickets for fences, railroad ties, stuff—manufactured or partly manufactured—for boxes, chairs and bedsteads, hop poles, brush handles, brush backs, looking-glass backs, gun stocks, plow beams and plow handles	0	2	3
Sawed stuff for window blinds, not exceeding one fourth of an inch in thickness, and window sashes and blinds	0	7	0

☞ * *Lumber* shall not be cleared by measurement when carried in a boat having other articles on board paying toll by weight, but such lumber shall, in all such cases, be also cleared by weight.

When a cargo is composed entirely of lumber, which can be cleared by weight or measure, the whole of such cargo shall be cleared by measurement or by weight, as the shipper or master may elect, and in no case shall a portion of any such cargo be cleared by measurement and the other portion by weight.

M.

Mahogany (except veneering), reduced to inch measure, per 1,000 feet per mile	0	5	0
Manure	0	1	0
Mattresses	0	2	0
Mechanics' tools (see Tools).			

	cts.	m.	fr.
Merchandise enumerated and non-enumerated	0	1	5
Molasses	0	1	5
Moose skins	0	3	0

N.

Nails	0	1	5

O.

Oats	0	2	5
Oil cake	0	2	0
Oil meal	0	2	0
Onions	0	1	0

P.

Passengers, over ten years of age, per mile	0	0	5
Petroleum, or earth oil	0	0	5
Peas	0	3	0
Pianofortes	0	2	0
Pickets for fences (see Lumber No. 3)	0	2	3
Pig copper	0	1	0
Pig iron	0	2	0
Plane stocks (see Lumber No. 3)	0	2	3
Plaster, calcined, or plaster of Paris	0	2	0
Plow beams (see Lumber No. 3)	0	2	3
Plow castings	0	2	0
Plow handles (see Lumber No. 3)	0	2	3
Pork, salted	0	2	0
Posts, split and round, not exceeding eight feet in length, carried in boats per M. per mile	3	0	0
Potatoes	0	2	0
Powder and gunpowder	0	4	0

R.

Rags	0	2	0
Railroad chairs	0	1	5
Railroad iron	0	2	0
Railroad ties (see Lumber Nos. 2 and 3).			
Rails for fences, not exceeding fourteen feet in length, carried in boats, per M, per mile	3	0	0
On the same, if carried in rafts, per M, per mile	8	0	0
Roots, esculent	0	1	0
Rowing oars (see Lumber No. 3)	0	2	3
Rye	0	3	0

S.

Salt, foreign	0	2	5
Salt manufactured in this State	0	1	5
Sand	0	1	0
Sawed stuff (see Lumber Nos. 2 and 3).			
Sawdust	0	1	0
Scrap iron	0	2	0
Sheep, live	0	2	0
Shingles, in boats, per 1,000 pounds per mile	0	1	5
Shingles, in boats, per M, per mile	0	0	5
Shingles, per M, per mile in rafts	0	4	0
Ship knees	0	2	3
Ship knees, transported in rafts	0	5	0
Ship stuffs	0	2	0
Shooks, stave	0	1	5
Shrubbery and trees	0	4	0
Siding (see Lumber No. 1)	0	2	3
Siding (see Lumber No. 2) per 1,000 feet surface measure	0	6	5
Skins of animals producing furs	0	3	0
Slate	0	1	0
Sleighs	0	2	0
Soda ash	0	1	0
Spikes	0	1	5
Split posts and round, not exceeding eight feet in length, carried in boats, per M. per mile	3	0	0
On the same, if carried in rafts, per M, per mile	8	0	0
Spokes (see Lumber No. 3)	0	2	3

	cts.	m.	fr.
Staves and heading, sawed, cut and dressed, or partly dressed, shooks and stave bolts and buts, not exceeding four feet and a half in length, transported in boats	0	1	5
On the same, if transported in rafts	0	1	5
Steel	0	5	0
Stone for the manufacture of lime	0	1	0
Stone, wrought	0	1	5
Stone, wrought and partly wrought	0	1	0
Stove furniture, not cast iron	0	3	0
Stovepipe	0	3	0
Stoves	0	3	0
Straw, pressed, and any pressed vegetable substance used for the manufacture of paper or paper pulp	0	1	0
Sugar	0	1	5

T.

Tallow	0	1	5
Tan bark, per cord per mile, carried in boats	0	5	0
Tan bark, per cord per mile, carried in rafts	2	0	0
Tan bark, ground, per 1,000 pounds per mile	0	2	5
Tar	0	1	5
Timber, per 100 cubic feet per mile, transported in boats:			
Squared and round	0	6	0
Squared and round, transported in rafts	1	0	0
Sawed timber (see Lumber No. 2) per 1,000 feet per mile	0	6	5
Tobacco unmanufactured, going towards tide water	0	1	0
Tobacco, going from tide water	0	1	5
Tools, mechanics'	0	2	0
Trenails (see Lumber No. 2)	0	2	3
Trees and shrubbery	0	4	0
Turnips	0	1	0
Turpentine	0	1	5

V.

Varnish	0	2	0
Vinegar	0	2	0

W.

Wagons	0	2	0
Ware, flint	0	1	5
Water lime	0	1	5
Water pipes	0	1	5
Wheat	0	3	0
Willow ware	0	2	0
Window blinds and sawed stuff (see Lumber No. 3)	0	7	0
Window sashes	0	7	0
Wood for fuel, per cord per mile	0	5	0
Wood for fuel, per cord per mile, carried in rafts	2	0	0
Wood used in the manufacture of salt, per cord per mile	0	5	0
Wool	0	2	0

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